"A STUDY TO ASSESS THE EFFECTIVENESS OF HOT WATER FOOT BATH THERAPY IN REDUCING BODY TEMPERATURE AMONG PATIENTS WITH FEVER IN MEDICAL WARDS IN RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL, CHENNAI-03."

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CERTIFICATE

This is to certify that this dissertation titled **"A STUDY TO ASSESS THE EFFECTIVENESS OF HOT WATER FOOT BATH THERAPY IN REDUCING BODY TEMPERATURE AMONG PATIENTS WITH FEVER IN MEDICAL WARDS IN RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL, CHENNAI-03."** is a bonafide work done by Mrs. M.Muthu Priya, College of Nursing, Madras Medical College, Chennai – 600003 submitted to THE TAMILNADU DR.M.G.R. MEDICAL UNVERSITY, CHENNAI in Partial fulfillment of the requirements for the award of Degree of Master of Science in Nursing, Branch I, MEDICAL SURGICAL NURSING, under our guidance and supervision during the academic period from 2013 – 2014.

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ABSTRACT

An interventional study was carried out to find the effectiveness of hot water foot bath therapy in reducing body temperature. Simple random sampling was used, 60 male and female subjects with fever ranging from 100^0F- 103^0F admitted in Rajiv Gandhi Government General Hospital, Chennai-03 were selected. 30 for each experimental and control group. True experimental design was used to conduct the study. Pre assessment of Body temperature was done using standardized scale clinical thermometer . For experimental group, Hot water foot bath therapy was given for 15 -20 minutes. A post assessment was conducted to determine the effectiveness of Hot water foot bath therapy. Data was analyzed with both descriptive and inferential statistical methods. Independent t test was used to compare the effectiveness between experimental and control group and karl Pearson's co efficient of correlation was used to find out the relationship between demographic variables. After Hot water foot bath therapy, experiment group subjects are reduced by 1.59^0F and control group subjects are reduced using Hospital routine care by 0.53^0F **.** Differences between pre assessment and post assessment score was analysed using mean difference with 95% CI. The findings of the study shows that there is a significant reduction in elevated body temperature after Hot water foot bath therapy.

The investigator thereby concludes that the Hot Water Foot Bath Therapy has reduced temperature on subjects with fever. Thus it encompasses commitment by nurse who can practice Hot Water Foot Bath Therapy to reduce the degree of temperature for fever subjects.

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LIST OF ABBREVIATIONS

S.NO	ABBREVIATIONS	EXPANSIONS
1.	**HWFBT**	Hot Water Foot Bath Therapy
2.	**X^2**	Chi- square
3.	**P**	Probability level
4.	**T**	Assessment of significance
5.	**H**	Hypothesis
6.	**SD**	Standard Deviation
7.	**WBC**	White Blood Cells
8.	**N**	Number of subjects

Chapter –I

Introduction

CHAPTER -I
INTRODUCTION

"The water in the vessel is sparkling, the water in the sea is dark. The small truth has words which are clear , the great truth has great silence"

- Rabindranath Tagore.

The human organism consists of trillions of cells all working together for the maintenance of the entire organism. While cells may perform very different functions, all the cells are quite similar in their metabolic requirements. Maintaining a constant internal environment with all that the cells need to survive (oxygen, glucose, mineral ions, waste removal, and so forth) is necessary for the well-being of individual cells and the well-being of the entire body. The varied processes by which the body regulates its internal environment are collectively referred to as homeostasis.

The living bodies have been characterized with a number of automated processes, which make them self-sustainable in the natural environment. Among these many processes are that of reproduction, adjustment with external environment, and instinct to live, which are gifted by nature to living beings. The survival of living beings greatly depends on their capability to maintain a stable body temperature irrespective of temperature of surrounding environment. This capability of maintaining body temperature is called thermoregulation.

Body temperature depends on the heat produced minus the heat lost. Heat is lost by radiation, convection, and conduction, but the net loss by all three processes depends on a gradient between the body and the outside. Thus, when the external temperature is low, radiation is the most important form of heat loss. When there is a high external temperature, evaporation is the most important form of heat loss. The balance of heat produced and heat lost maintains a constant body temperature. However, temperature does vary during the day, and this set point is controlled by the hypothalamus.

Fever, also known as pyrexia is one of the most common medical signs and is characterized by an elevation of body temperature above 98.4 °F (37.2 °C) due to an increase in the temperature regulatory set-point. This increase in set-point triggers increased muscle tone and chills.

Febricula is an old term for a low-grade fever, especially if the cause is unknown, no other symptoms are present, and the patient recovers fully in less than a week. As a person's temperature increases, there is, in general, a feeling of cold despite an increase in body temperature. Once the new temperature is reached, there is a feeling of warmth.

A fever can be caused by many different conditions ranging from benign to potentially serious. Some studies suggest that fever is useful as a defense mechanism as the body's immune response can be strengthened at higher temperatures, however there are arguments for and against the usefulness of fever, and the issue is controversial. With the exception of very high temperatures, treatment to reduce fever is often not necessary; however, antipyretic medications can be effective at lowering the temperature, which may improve the affected person's comfort.

Fever differs from uncontrolled hyperthermia, in that hyperthermia is an increase in body temperature over the body's thermoregulatory set-point, due to excessive heat production or insufficient thermoregulation

Table:1 Temperature Classification:

Hypothermia	$<35.0^0$C (95.0^0F)
Normal	36.5^0 C –$37\ ^0$C (97.7^0F–98.6^0F)
Fever	37.0^0C –38.3^0C (98.7^0F–100.9^0F)
Hyperthermia	38.5^0C –39.9^0C (101^0F–103.9^0F)
Hyperpyrexia	40.0^0C –41.5^0C (104^0F–106.7^0F)

Source: Global Burden of Disease, 2008.

A wide range for normal temperatures has been found. Fever is generally agreed to be present if the elevated temperature is caused by a raised set point and:

- If Temperature in the anus (rectum/rectal) is at or over 37.7 °C (99.9 °F)
- If Temperature in the mouth (oral) is at or over 37.1 °C (98.9 °F)
- If Temperature under the arm (axillary) or in the ear (otic) is at or over 36.7 °C (98.2 °F)

Harrison's textbook of internal medicine defines a fever as a morning temperature of >37.2°C (>98.9°F) or an evening temperature of >37.7°C (>99.9°F) while the normal daily temperature variation is typically 0.5°C (0.9°F).

Antipyretic therapy is an effective pharmacological measure to reduce fever. Along with pharmacological measures there are many non pharmacological measures like cold sponging, tepid sponging, external cooling, warm water therapy that are found to be effective in controlling the temperature. There is a controversy regarding the indication for and the use of the heat and cold therapy. But many studies have shown that, Warm water therapy is an effective method for treating fever.

Hydrotherapy is the use of water in the treatment of disease. Warm water therapy additionally uses its temperature effects, as in hot baths, saunas, wraps, etc. Hydro- and warm water therapy are traditional methods of treatment that have been used for the treatment of disease and injury by many cultures, including those of ancient Rome, China, and Japan. Water therapy has been around for centuries. The ancient Greeks took therapeutic baths. Water is an important ingredient in the Traditional Chinese and Native American healing systems.

The recuperative and healing properties of hydrotherapy are based on its mechanical and thermal effects. It exploits the body's reaction to hot and cold stimuli, to the protracted application of heat, to pressure exerted by the water and to the sensation it gives. The nerves carry impulses felt at the skin deeper into the body, where they are instrumental in stimulating the immune system, influencing the production of

stress hormones, invigorating the circulation and digestion, encouraging blood flow, and lessening pain sensitivity.

Generally, heat calms and soothes the body, slowing down the activity of internal organs. Water also has a hydrostatic effect. It has a massage-like feeling as the watesr gently kneads your body. Water, in motion, stimulates touch receptors on the skin, boosting blood circulation and releasing tight muscles.

1.1 NEED FOR THE STUDY

"Water is the driving force of all nature"

- Leonardo da vinci

Fever has been recognized as a symptom and not a disease. Fever is a natural response of the body that helps in fighting of foreign substances. Thermoregulatory center in the hypothalamus regulates body temperature. Once the temperature raises the person often feels warm, the cellular metabolism increases, oxygen consumption rises, heart rate and respiratory rate increases to meet the metabolic needs of the body. Increased metabolism uses energy that produces additional heat.

During fever, dilation of internal blood vessels and constriction of peripheral blood vessels occurs. It weakens the patient and makes him/her uncomfortable and anxious. Therefore fever as a symptom and its management is a concern to both healthcare professionals as well as patients. Providing comfort to patient is a basic and most important nursing intervention.

The present healthcare system under National Health Policy has been given a lot of emphasis on merging of alternative and complimentary therapies along with other treatments to provide comprehensive healthcare. Hydrothermal therapy is one such modality shown to be effective in reducing fever. Studies have shown that warm bathing helps to provide comfort and reduce high temperature. Heat causes the

relaxation of the blood vessels, there by opening the vessels and increasing blood flow to the injured area.

Fever is the result of an immune response by your body to a foreign invader. These foreign invaders include viruses, bacteria, fungi, drugs, or other toxins. These foreign invaders are considered fever-producing substances (called pyrogens), which trigger the body's immune response. Pyrogens tell the hypothalamus to increase the temperature set point in order to help the body fight off the infection. Fever is a common symptom of most infections. In children, immunizations or teething in may cause low-grade fever. Autoimmune disorders, medication reactions, seizures, or cancer may also cause fevers.

A fever makes the person to feel very uncomfortable. Signs and symptoms of a fever include the following:

- Temperature greater than 98.4 ^{0}F (37^{0}C) in adults and children
- Shivering, chills
- Aching muscles and joints
- Headache
- Intermittent sweats
- Rapid heart rate or palpitations
- Skin flushing
- Feeling faint, dizzy, or lightheaded
- Weakness
- With very high temperature (> 104^{0}F/40^{0}C), convulsions, hallucination, or confusion is possible.

Along with having the generalized symptoms of a fever, taking temperature with a thermometer can confirm the diagnosis of a fever. A temperature greater than 98.4^{0}F in adults or children is considered a fever. Temperature is ultimately regulated in the hypothalamus. A trigger of the fever, called a pyrogens, causes a release of prostaglandin E2(PGE2). PGE2 then in turn acts on the hypothalamus, which generates

a systemic response back to the rest of the body, causing heat-creating effects to match a new temperature level.

In many respects, the hypothalamus works like a thermostat. When the set point is raised, the body increases its temperature through both active generation of heat and retaining heat. Vasoconstriction both reduces heat loss through the skin and causes the person to feel cold. If these measures are insufficient to make the blood temperature in the brain match the new setting in the hypothalamus, then shivering begins in order to use muscle movements to produce more heat. When the fever stops, and the hypothalamic setting is set lower; the reverse of these processes (vasodilation, end of shivering and non shivering heat production) and sweating are used to cool the body to the new, lower setting.

Naturopathic Treatment for Fever

For a mild fever between 100^0F-$103\ ^0$F:

- Treatment goal is to encourage fever
- Hot foot bath with blanket pack
- Finish by pouring cold water over feet
- Hot water and/or diaphoretic herbal tea to promote sweating

Normal body temperatures vary depending on many factors, including age, sex, time of day, ambient temperature, activity level, and more. A raised temperature is not always a fever. For example, the temperature of a healthy person rises when he or she exercises, but this is not considered a fever, as the set-point is normal. On the other hand, a "normal" temperature may be a fever, if it is unusually high for that person. For example, medically frail elderly people have a decreased ability to generate body heat, so a "normal" temperature of 37.3 °C (99.1 °F) may represent a clinically significant fever.

Hot water foot bath therapy (HWFBT) one of the hydrotherapeutic measure, which improve warmth, promotes muscle relaxation, relieves pain, dilates blood vessel and promotes circulation, relaxes the connective tissue and provides a soothing and healing effect. HWFBT is said to treat the underlying infection by activating the WBCs and immune system. Hot application to the skin increases the oxidation of the toxins and increases the blood flow through the peripheral vessels. It also increases the ability of the phagocytes to destroy the germs and detoxify the blood. Beneficial effect of increased blood flow to the tissue includes facilitation of drainage and "wash-out" effect, purging the tissue of debris and by products of tissue injury. Thus large quantities of bacterial poison can be eliminated.

Warm application to the foot causes the congested blood to flow towards distant parts of the body and is brought to the dilated vessels of the foot and leg. When HWFBT applied for 15-20 minutes the vessels in the feet starts expanding and gets improved circulation, neutralizing acid and killing bacteria, and relieving aches, tiredness and fever. The improved blood circulation resets the hypothalamic set points by heat transfer from higher heat area to lower heat area.

Some of the non pharmacological measures such as tepid sponging, cold sponging is also found to be effective in reducing fever. But it may result in rapid cooling and may cause shivering in the patients, which is a discomfort to the clients. A randomized control trial was conducted in an accident and emergency department with 20 children aged 5months to 5 years with fever equal to or greater than 38.9^{o}C. Children were randomly assigned to acetaminophen and acetaminophen and 15 minutes tepid sponging bath. Results showed that sponge bath cooled faster during first hour but there was no significant temperature difference between two study groups. On the other hand in the sponge bath group had significantly higher discomfort scores due to shivering as a result of rapid cooling in cold sponging. But in case of HWFBT rapid cooling is not brought about. Temperature is brought down gradually, so that it allows slow heat loss, thus avoiding rapid cooling and shivering.

A HWFBT increases nourishment to tissues, calms and relaxes tension. It important for the nurse to consider the treatment modality, that is effective for the client, considering all the factors affecting thermoregulation. HWFBT is considered as a non pharmacological, safe and side effect free, cost effective, easy to administer. As pharmacological measures have reported side effects, it is always better to use non pharmacological measures to reduce fever. There are very few studies that are conducted to test and compare the effectiveness of different non pharmacological measures to reduce the fever.

In the light of above mentioned back ground, coupled with the investigator's experience on management of fever patients, literature reviewed on the effectiveness of HWFBT and also due to the dearth of studies on effectiveness of HWFBT, it is the interest of the investigator to evaluate the effect of hot water foot bath therapy on fever.

1.2 STATEMENT OF THE PROBLEM

A study to assess the effectiveness of hot water foot bath therapy in reducing body temperature among patients with fever in medical wards in Rajiv Gandhi Government General Hospital, Chennai-03.

1.3 OBJECTIVES

- To assess the body temperature of the patient before hot water foot bath therapy in both experimental and control group.
- To assess the body temperature of the patient after hot water foot bath therapy in experimental group.
- To compare the changes in body temperature after hot water foot bath therapy in both Experimental and Control group.
- To determine the association of changes in body temperature in both experimental and control group with selected demographic variables.

1.4 OPERATIONAL DEFINITIONS

1. Hot water foot bath therapy

It refers to the immersing of both the feet in hot water with a temperature of 100^0 F- 110 ^{0}F by bath thermometer for a period of 15 to 20 minutes administered by the investigator.

2. Fever

It refers to rise in body temperature of subjects ranging from 100^0F to 103^0F.

3. Subjects

It refers to all the adult subjects admitted with fever or who had developed fever during their period of hospitalization in the medical wards of Rajiv Gandhi Government General Hospital with a temperature of 100^0 F to 103^0F.

4. Effect

It refers to the ability of hot water foot bath therapy to bring about a change in body temperature as measured by the investigator using a clinical thermometer.

1.5 HYPOTHESIS

H_1-There will be a significant difference in the temperature between experimental and control group after hot water foot bath therapy at 0.05 level of significance.

H_2 -There will be a significant association of changes in temperature of subjects with selected demographic variables at 0.05 level of significance.

1.6 ASSUMPTIONS

- Fever may be a result of several causes and it can be controlled by treating the underlying infection.
- Hot water application causes vasodilatation and there by enhances the immune system to reduce infection.
- Hot water application may have some effect on temperature.

Chapter –II

Review of Literature

CHAPTER – II

REVIEW OF LITERATURE

"Before you read, pre read"

- Van Doren

The primary purpose of reviewing relevant literature is to gain a broad background or understanding of the information that is available related to the problem. In conducting research, the literature review facilitates selecting a problem and purpose, developing a framework and formulating a research plan. Literature review is a key step in research process. Review of relevant literature is an analysis and synthesis of research sources to generate a picture of what is known about a particular situation and knowledge gaps that exist in the situation . in order to accomplish the goal in the present study , an attempt has been made to review and discuss the literature.

2.1 REVIEW OF RELATED LITERATURE

The research has reviewed the relevant literature in support of problem statement of the present study. Literatures from 1995 to 2013 were reviewed . literature review was carried out in support of

Part I: Literature related to management of fever

Part II: Literature related to application of Hot water foot bath therapy

Part III: Literature related to application of hot water foot bath therapy for management of fever

PART I: LITERATURE RELATED TO MANAGEMENT OF FEVER

Georgina casey 2000, the increased heat can also destroy invading microorganisms and increase their rate of removal from the body. At the cellular level , a fever is generated when infective agents such as bacteria or viruses (also called exogenous pyrogens) invade body cells. These trigger the release of a variety of proteins from the cells.

O' Donnell et. Al., 1997 evaporative methods are more effective than the conductive methods partly because of the fact conductive methods induce shivering.

Ucheepines 2008, any cold applications prolonged over 15- 20 minutes can cause marked internal congestion. Physical cooling methods to reduce fever may be exhausting to patients by shivering and physiological responses reducing the strength to fight basic diseases eg: in severe illness like typhoid fever and actual harm may result from cold application to patient.

Jogan Luther prospective comparative study was done in Netherlands, to compare the efficacy of different cooling methods to reduce fever. Fifty ICU patients with fever were enrolled in the study and were assigned to five groups. Group-1 conventional cooling, group-2 cooling with air circulating blankets, group-3 water circulating gel coated pads, group-4 intravascular heat exchange system, and group-5 water circulating blankets. Temperature decline was significantly higher in cooling with water circulating blankets, gel pads and intravascular cooling, when compared to conventional cooling and air circulating blankets. No adverse events are noted. However the absence of this can be due to small sample sizes.

The Maryland researchers (2008) found that anti fever drugs such as aspirin and acetaminophen may prolong certain information. They stated that " the good news is that anti fever drugs make people feel better when they have infections. The bad news is that they may cause the illness to linger longer.

Regional acute Hospitals in Hong Kong Hospital. A survey conducted on fever management practices among pediatric nurses in three regional acute Hospitals in Hong Kong Hospital. The aim of the study was to find if warm water bath is still in use to reduce fever and rationale behind. The survey result shows that 98.2% nurses used to removal of thick clothing and encourage fluid intake. 96.5% advice to seek medical advice.89.4% were used warm bathing, 63.1% used to give tepid sponging, 56.8% used ice bag to reduce fever in children. It shows that warm bathing is ranked the third commonly used method for fever management. The rationale behind warm bath helps to reduce high fever, more comfortable than tepid sponging and other measures.

Visveswara A comparative randomized control trial was conducted in CMC Vellore, to assess the effectiveness of tepid sponging and antipyretic drug versus only antipyretic drug in the management of fever among children. Hundred and fifty samples with temperature $>101^0$F were selected and assigned into two groups. After the intervention, temperature was checked at every 30, 45, 60, 90 and 120 minutes. The results showed, apart from the initial rapid temperature reduction, addition of tepid sponging to antipyretic administration does not offer any advantage in ultimate reduction of temperature and may result in additional discomfort such as shivering.

PART II : LITERATURE RELATED TO HOT WATER FOOT BATH THERAPY

Bathing 2006, foot bath is an exquisitely relaxing preludge to any body treatment or an amazing treat in and of itself. Foot baths are of great for helping ourselves to relieve aches and pains and for reviving hot, tired, burning feet and a

fatigued body. In general , they are a delicious way to pamper these hardworking and often neglected part of us.

Wong(2008) explained that external cooling promotes heat production while enhancing heat loss by producing vasoconstriction , shivering & goose bumps. Shivering can increase can increase heat production 4 to 5 times than normal.

Liao WC (2002), which believe that "an ounce of prevention is worth a pound of cure provides an Information regarding many natural remedies for managing the pain. One among such method is the use of hot foot bath. A hot foot bath is a local immersion bath covering the feet and ankles at temperatures ranging from 100° to 115° F (43°C-46°C). Foot bath treatment can help to relieve pain anywhere in the body from toothache to backache. Hot foot baths increase blood flow through the entire skin surface, relieving congestion in internal organs and brain. This type of bath also elevates the body temperature, relaxes tense muscles and there by relieves the pain.

Hot Foot Bath – Good for Health , states that a foot bath relaxes the feet in addition to providing health benefits. Feet are soaked in a free-standing foot bath in a container. Salts and essential oils can be added to foot bath for additional therapeutic effects. Pain relief is a benefit of Warm foot bath.

Agatha M. Thrash, One of the most versatile and helpful of the true remedies is the hot foot bath. The hot foot bath is a true remedy. It can be used to reduce a fever since it causes the number of circulating white blood cells to be increased and the toxins which cause an elevated body temperature are removed, and the thermostat is restored to normal. The hot foot bath can combat a cold, headache, or any congestion of the head, the chest, or the pelvic organs in menstrual difficulties by pulling excess blood from the congested part, thereby increasing the effective circulation. The hot foot bath can open up the totally blocked nasal passage of a person in about five minutes. There is a measured increase in the flow of blood to the pelvic organs as well as to the structures of the nose, throat, and bronchi when the feet are placed in hot water.

Dada Dharmavedananda, Because of the heating of the blood in the feet and under legs, the pores of the skin of the entire body will open, and the patient will start to sweat. This removes toxins from the body. With increased circulation, abdominal and reproductive organs are strengthened, the menstrual cycle is brought back to normal, and tensions around the heart are relieved.In the case of suddenly catching a cold or in the first stage of fever, it is especially helpful. For painful feet or rheumatism, use this treatment daily for twenty minutes.

Yang, Huei-Lin et.al.,The Effects of Warm-Water Footbath on Relieving Fatigue and Insomnia of the Gynecologic Cancer Patients on Chemotherapy. Most patients experience fatigue during chemotherapy. Ignoring this fatigue can contribute to worsening overall health of patients and a slowed recovery process, We investigated the effectiveness of a warm-water footbath on relieving fatigue and insomnia problems in patients undergoing chemotherapy.

Osaka, A comparison study was conducted on the effect of nursing care using footbath, foot massage and foot massage combined with footbath for relaxation at Japan Academy of Nursing Science, Osaka University. The purpose of this study was to investigate the relaxation response of to footbath, foot massage, and foot massage combined with footbath compared with that of control group. The study result suggested that these forms of care generate the relaxation response as shown by the decrease in heart rate and the increase in foot skin temperature contributing to psychological and physiological well-being.

In **Nagoya University School of Health,** A study was carried on Effects of the footbath on tympanic temperature, sweat rate, blood pressure, and heart rate among the elderly person at Nagoya University School of Health. The study concluded that the footbath is safe, does not cause any change in blood pressure and is expected to provide mild warming for the elderly.

Yokohama, A study was conducted on the effects of Wrapped Warm on the autonomic nervous system and psychoneuroimmunological activities among terminal cancer inpatients at Yokohama City University, Japan..The study concluded that the patients in the footbath group were significantly relaxed and tended to be relieved from pain.

PART III: LITERATURE RELATED TO HOT WATER FOOT BATH THERAPY FOR MANAGEMENT OF FEVER

Spring 2008, during the time of bath the body core temperature will begin to rise and cause sweating. This is necessary to cool the vital organs brain and essential systems of the body. In a 30 min session 1/3 of your body‘s blood volume will move to the skin surface and extremities to achieve this cooling. To assist with heat management during the bath, a large bowl of very cold water and hand towel are essential. A cold , wet towel placed on the face , head and chest can accelerate the cooling effect.

Henker 1999, mentioned warming as an innovative method to treat fever. He rationalizes the benefit of warming as prevention of shivering , which increases the oxygen demand in critically ill patients. This rationale is applicable to warming in Japanese nursing practice. In Japan , it is believed that treating patients by warming in the process of developing an increase in body temperature helps the temper rise to the altered thermoregulation set point. After the patients body temperature reaches this set point level the temperature will begin to decrease. Thus warning is assumed to accelerate this process and curtails the duration of the patient’s suffering.

A study was done in Coimbatore to assess the effect of hot water foot bath therapy on patients with fever. Thirty patients with temperature ranging from $99^{o}F$ – $103^{o}F$ were selected for the study by using purposive sampling technique. A quasi experimental one group pre test post test design was used in this study. The HWFBT was administered after checking the temperature of the patient. After 20 minutes of administration the temperature was again assessed. Paired ‘t’ test was done to find out

significant difference in temperature before and after intervention. The average post test temperature was less than the mean pretest temperature. There was a significant reduction in temperature of patient after the intervention at 0.05 level.

Jean Klastersky, 2004, A study was conducted to assess the effect of foot bathing on distal- proximal skin temperature gradient in elders in Taiwan. Six older adults, under a cross- over design, were randomized to the sequence of water bath temperatures. The value of distal proximal temperature gradient with 41.C water was slightly higher than 40.C (t= 0.04-1.48, all p->0.05).Both 40.C and 41.C foot bathing for one hour thus increases distal proximal gradient and is an effective way to affect whole body skin blood flow and trigger heat dissipation.

Allison, 1998 A study was conducted to investigate the effects of foot bathing on autonomic nerve and immune function. Oral, abdominal and foot- bathing temperatures were taken during and after foot- bathing. Distal- proximal skin temperature gradient was calculated by subtracting abdominal temperature from foot temperature. Results showed that value of distal proximal temperature gradient was increased in 10^{th} minute bathing at both water temperatures and maintained above 0ºC. The value of distal proximal temperature gradient with 41.C water was slightly higher than 40.C (t= 0.04-1.48, all p->0.05).Both 40.C and 41.C foot bathing for one hour thus increases distal proximal gradient and is an effective way to affect whole body skin blood flow and trigger heat dissipation.

Yamaguchi, A study was conducted on physiological effects of mild foot bath at Graduate School of Health and Welfare, Yamaguchi Prefectural University. They examined on 31 before, during and 10 minutes foot bath at 41.C. This observation suggests that about two- thirds of experienced a true rest as well as mental relaxation during the foot bath. In addition, this study recommended for further research to find out “relax” effect of foot bath.

Hishinuma, 1997 A study was conducted to investigate relaxation response of to footbath, foot massage and foot massage combined with foot bath compared with that of control group at Japan. As for skin temperature immediately after care, all forms of care produced significant increases in comparison with control (foot bath $p<0.05$: foot massage and foot massage combined with foot bath $p<0.01$). The result suggests that these forms can generate relaxation response by decrease in heart rate and increase in foot skin temperature.

A study was done in Coimbatore to assess the effect of hot water foot bath therapy on patients with fever. Thirty patients with temperature ranging from $99^{o}F$ – $103^{o}F$ were selected for the study by using purposive sampling technique. A quasi experimental one group pre test post test design was used in this study. The HWFBT was administered after checking the temperature of the patient. After 20 minutes of administration the temperature was again assessed. Paired 't' test was done to find out significant difference in temperature before and after intervention. The average post test temperature was less than the mean pretest temperature. There was a significant reduction in temperature of patient after the intervention at 0.05 level.

Loten C 2006, The study was conducted to explore the effects of warm footbath on heart rate variability and body temperature on seventeen middle aged female volunteers. A cross-over comparison research design and convenience sampling methods were used. The result of the study showed that warm footbath can change heart rate variability and body temperature and the experienced relaxing, comfortable, and warm sensation.

2.2 CONCEPTUAL FRAMEWORK

Conceptual framework is a group of concepts and a set of proportion that spell out the relationship between them. Conceptual framework deals with abstractions , (concepts) that are assembled by virtue of their relevance to a common theme. Conceptual framework plays several interrelated roles in the progress of science. It serves as a spring board for the generation of research hypothesis and can provide an important concept for scientific research. The conceptual framework facilitates communication and provides systematic approach to nursing research, education and communication.

MODIFIED ORLANDO'S THEORY OF DELIBERATIVE NURSING PROCESS:

Orlando was one of the earliest nurse theorist and one of the first person to develop nursing theory inductively from the empirical study of nursing practice. Orlando's theory has radically shifted the nurse's focus from the medical diagnosis to the nursing diagnosis, that is finding and meeting the client's immediate needs.

Orlando's nursing process is composed of the following basic elements:

1) Client's behavior
2) Reaction of the Nurse.
3) The Nursing activities which are designed for the client's benefit.

Orlando says that nurses should help in relieving the physical and mental discomfort and should not add to the client's distress.

In this theory , Nursing process is used by nurses to meet the client's needs. Meeting the needs improves the client's behavior. Client's behavior can be increased body temperature, rigor, vomiting, body pain, fatigue. Nurse reacts to the client's

behavior and act accordingly. After completion, the nursing action is evaluated for its effectiveness

CLIENT BEHAVIOUR:

Client's need is to relieve from increased body temperature which is caused by fever. The client who cannot receive the need feels helpless and the person's behavior reflects the feelings. Behavior can be verbal in which the client admits that he/she has elevated body temperature or it may be non verbal that is manifested by observation of physiological changes. Clients with Fever exhibits elevated body temperature, rigor, body pain, vomiting, fatigue, eye congestion etc.

NURSE REACTION:

Nurse perceives the clients behavior and feels that the client has some needs to be met and validating the same by communicating with the client. the nurse investigator assesses the pre assessment level of temperature by using clinical thermometer.

NURSE ACTION:

After verifying and identifying the need of the client , the nurse investigator's activity is in planning and implementing the nursing action for meeting the client's needs or improving the client's behavior. Here the nurse action is application of hot water foot bath therapy for 15 to 20 minutes for experimental group, after application, then client is assessed for the effectiveness of Hot water foot bath therapy in reducing body temperature by using the clinical thermometer. If there is marked reduction in body temperature , encourage to follow the therapy.

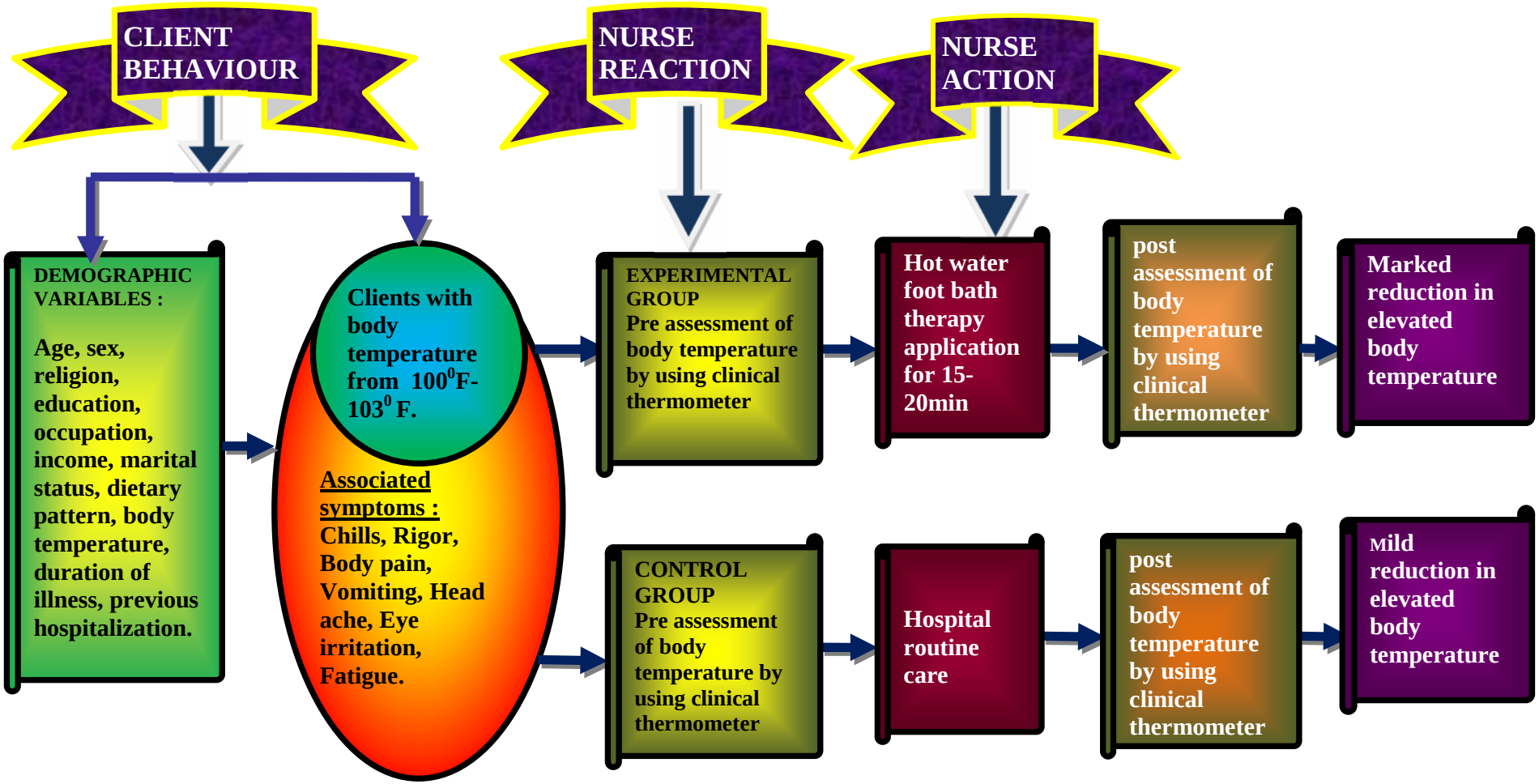


FIG 1: CONCEPTUAL FRAMEWORK
MODIFIED ORLANDO 'S THEORY OF DELIBERATIVE NURSING PROCESS

Chapter –III

Methodology

CHAPTER – III
METHODOLOGY

Research Methodology provides a brief description of the method adopted by the investigator in the study. The methodology of research refers to the principles and ideas on which the researchers base their procedures and strategies. It includes the research approach , design, population, sampling technique, development and description of the tools and intervention, pilot study report, procedure for data collections and data analysis.

The study is aimed at assessing the effectiveness of hot water foot bath therapy for reducing fever among patients with fever. The nature of the research problem and availability of the subjects guided the selection of research approach.

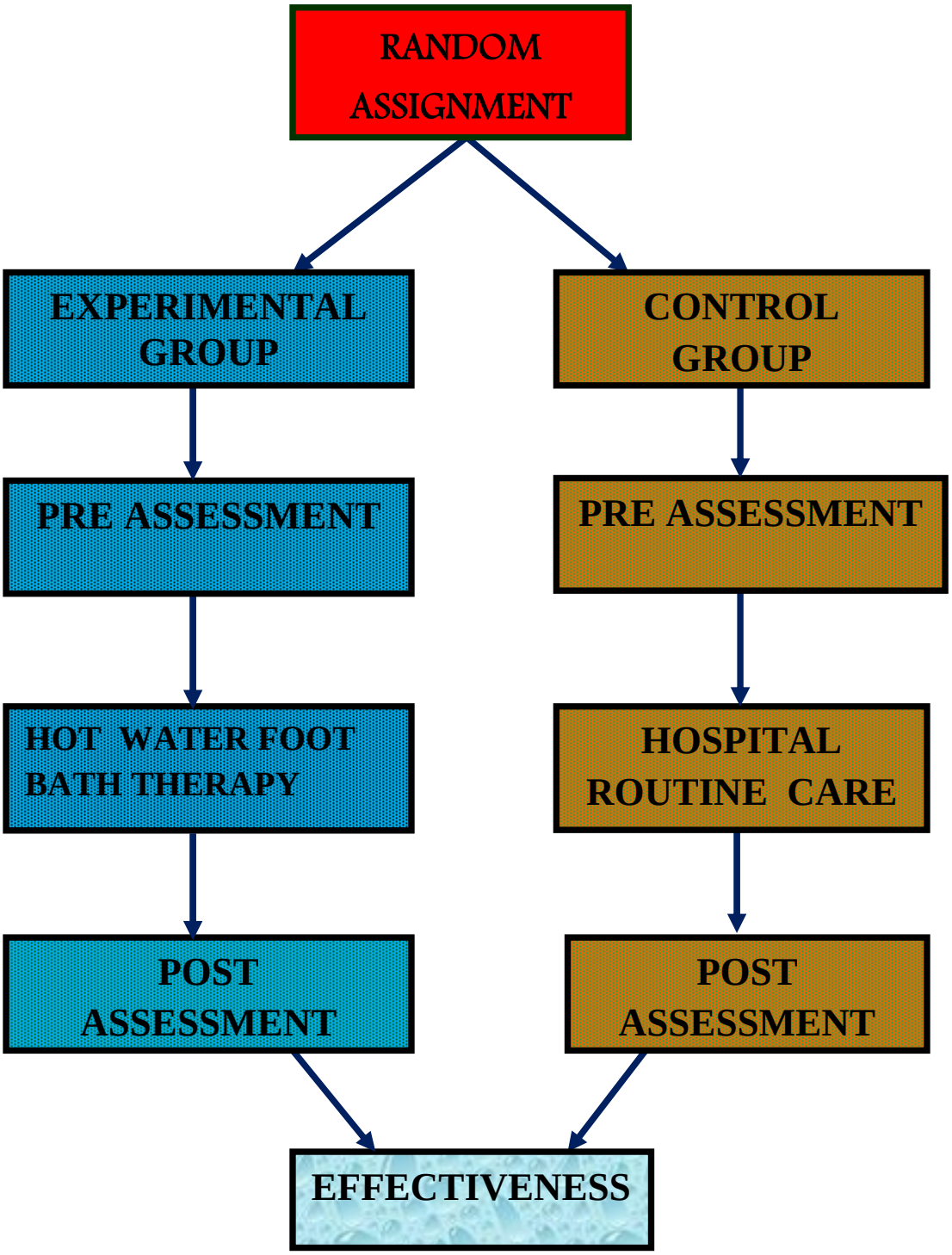
3.1 RESEARCH APPROACH

A Quantitative Approach was adopted in this study as the investigation is aimed at evaluating the effectiveness of Hot Water Foot Bath Therapy for reducing body temperature among subjects with fever.

3.2 RESEARCH DESIGN:

The research design is a plan, structure and strategy of investigations of answering the research question. It is all overall plan or the blue print the researcher selected to carry out the study. In view of the nature of the problem and to accomplish the objectives of the study, True experimental design was used to assess the effectiveness of Hot Water Foot Bath Therapy for reducing body temperature among subjects with fever.

Fig 2: RESEARCH DESIGN – PRETEST POST TEST ONLY DESIGN



3.3 VARIABLES

Independent Variable

Application of Hot Water Foot Bath Therapy

Dependent Variable

Body temperature of the subjects with fever

Demographic Variable

Age, sex, religion, marital status, educational status of the patient, occupation of the patient, income. dietary pattern and medical related information.

3.4 SETTING OF THE STUDY

The study was conducted at the medical wards , Rajiv Gandhi Government General Hospital, Chennai -03.

3.5 STUDY POPULATION

Population is the entire universe of individuals , objects and events potentially available for the research study. In this study, the population includes all subjects with Fever being treated at Medical Wards in Rajiv Gandhi Government General Hospital, Chennai -03.

3.6 SAMPLE:

All the subjects suffering from fever with age between 20 to 60 years who fulfills the inclusion criteria.

3.7 SAMPLE SIZE:

The sample size for this study is composed of 60 adult subjects, 30 for each experimental and control group.

3.8 SAMPLING TECHNIQUE

Probability Sampling Technique – Simple random sampling – lottery method used. subjects were randomly assigned to Experimental and control group.

3.9 CRITERIA FOR SAMPLE SELECTION

Inclusion criteria:

- ♣ Subjects who are able to follow instructions.
- ♣ Both male and female subjects between 20 to 60 years of age.
- ♣ Subjects whose temperature is between 100^0F- 103^0F.
- ♣ Subjects willing to participate in the study.
- ♣ Subjects with ability to understand Tamil or English

Exclusion criteria:

Subjects who are admitted with:

- Peripheral vascular disorder.
- Unconsciousness.
- Unable to assume sitting position.
- Peripheral neuropathy.
- Ulcer, lesion, or allergy in the leg.
- Chronic organ damage.

3.10 DEVELOPMENT AND DESCRIPTION OF TOOL

After an extensive review of literature and discussion with the experts the following tools are prepared to collect data.

Section A – Socio demographic profile consists of age, sex, religion, educational status, occupation, family income, marital status.

Section B – Medical related information like temperature, duration, previous history of hospitalization, associated illness & Measurement of body temperature using clinical thermometer.

3.11 ETHICAL CONSIDERATIONS:

The study was conducted after the approval of the Institutional Ethics Committee and Head of the Department, Institute of Internal Medicine, Madras medical College and Rajiv Gandhi Government General Hospital, Chennai -03. Informed consent was obtained from each study participant after giving full information about the study. Anonymity was assured to each participant and maintained by the researcher.

3.12 CONTENT VALIDITY

The content validity of the tool was established on the basis of opinion from the experts, Medical expert and Nursing expert and the tool was finalized.

3.13 PILOT STUDY

With formal permission from the Head of the department and content validity from the experts, the study was conducted in medical wards for 5 days at Rajiv Gandhi Government General Hospital, Chenai-03. By simple random sampling technique, 10 subjects with fever were selected. Pre assessment of body temperature was done by using clinical thermometer. For experimental group, hot water foot bath therapy was given and for control group hospital routine care was followed. Post assessment was done after 30 minutes using the same clinical thermometer. The study shows the feasibility to conduct the proposed study as planned.

3.14 RELIABILITY

After pilot study, reliability of the tool was assessed by using inter rater method and its correlation coefficient r value was 0.88. This correlation coefficient was very high and it was good tool for assessing the effectiveness of Hot Water Foot Bath Therapy in reducing body temperature among subjects with fever in medical wards.

3.15 DATA COLLECTION PROCEDURE

The study was conducted with the permission of the Head of the Department and the Institutional Ethical committee. Inclusion criteria was followed for sample selection. Information about the study was given to the subjects and informed consent was obtained in the prescribed form. The investigator assured the confidentiality. Subjects selected for pilot study were excluded. 60 Subjects were selected by Simple random sampling technique- lottery method was used to select the subjects from the sample frame and assigned to two groups – 30 per each experimental and control group. Pre assessment was done by using clinical thermometer. Data was collected from the subjects. Hot water foot bath therapy was given for Experimental group and for control group hospital routine care was followed , intervention was carried out with the hot water of about 100^0F to 110^0F by bath thermometer for the subjects are having body temperature ranging from 100^0F – 103^0F for 1- 3 times with 15 to 20 minutes duration. totally 30 min for a patient. Post assessment was carried out for both experimental and control group using the same clinical thermometer to evaluate the effectiveness of intervention.

3.16 PLAN FOR DATA ANALYSIS:

Data analysis was planned to include descriptive and inferential statistics.

Descriptive statistics:

- ♣ Frequency and percentage distribution to analyze the demographic data for fever subjects.
- ♣ Mean and standard deviation to assess the scores.

Inferential statistics:

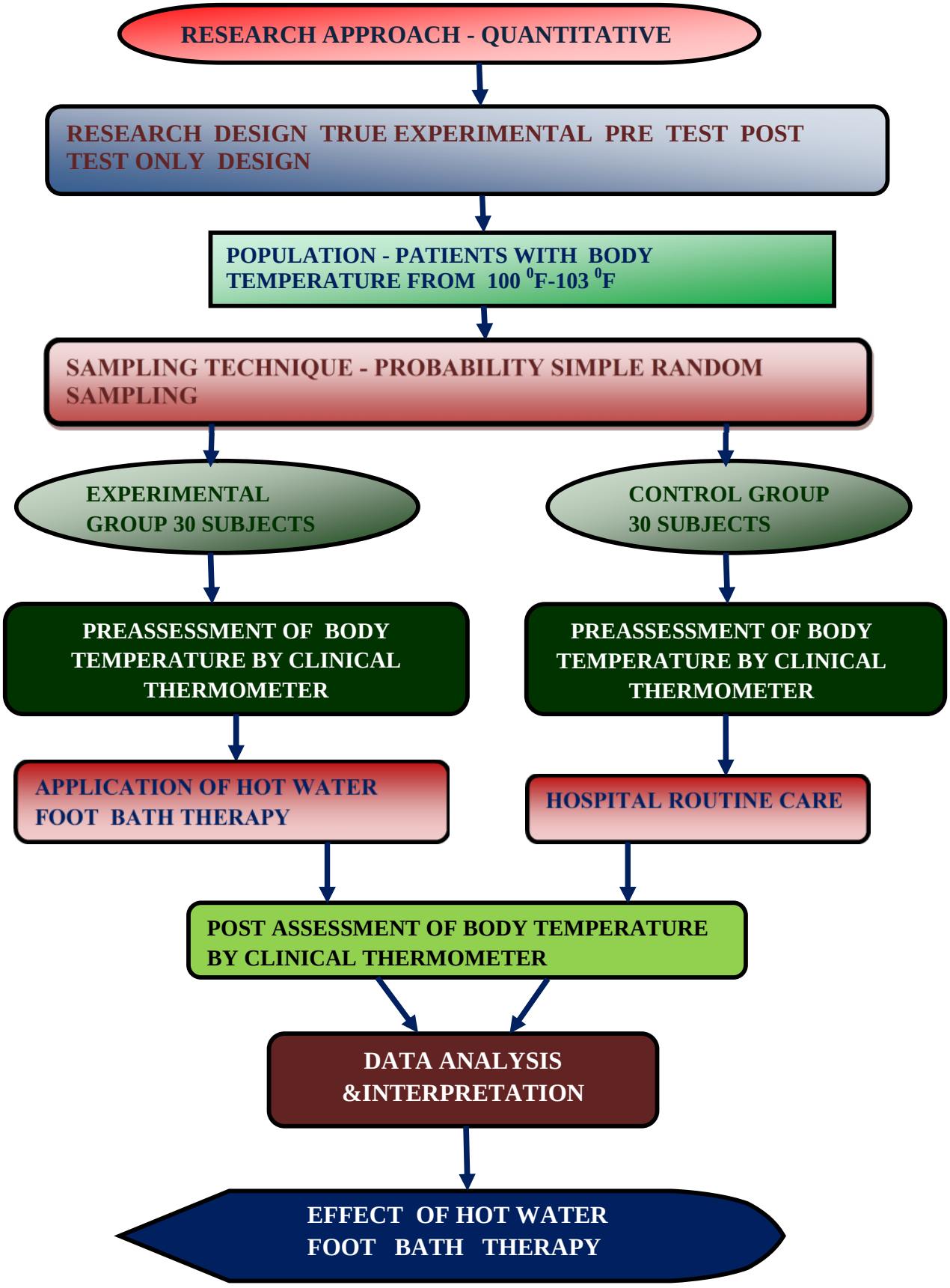
- ❖ Independent ‘t’ test to assess the effectiveness of hot water foot bath therapy in experimental groups.
- ❖ Paired ‘t’test to compare the effectiveness between pre assessment and post assessment.
- ❖ Chi-square to associate between the selected demographic variables.

3.17 PROJECTED OUTCOME:

Projected outcome of the study is that the fever subjects will have

- ❖ Reduction in degree of temperature.
- ❖ Improved blood circulation.
- ❖ Toxins removed from the body.

3.18) FIG:3 SCHEMATIC REPRESENTATION OF THE RESEARCH METHODOLOGY



Chapter –IV

Data analysis And Interpretation

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

" All things are subject to interpretation. Whichever interpretation prevails at a given time is a function of power and not the truth."

- Friedrich Nietzsche

Data analysis is the method of organizing data in such a way that the research question can be answered. Interpretation is the process of making sense of results and of examining the implications of the findings within a border context.

This chapter deals with the analysis and interpretation of data collected from subjects with fever.

The data collected was edited, tabulated, interpreted and findings obtained were presented in the form of tables and diagrams represent the following headings.

Section A **:** Assessment of Demographic profile

Section B **:** Assessment of changes in body temperature of the subjects before hot water foot bath therapy in experimental group.

Section C **:** Assessment of changes in body temperature of the subjects after hot water foot bath therapy in experimental group.

Section D **:** Comparison of the changes in body temperature of the subjects in both control and experimental group.

Section E **:** Determination of the changes in body temperature of the subjects in both control and experimental group with selected demographic variables.

Section A : Assessment of Demographic profile

TABLE 2: DEMOGRAPHIC PROFILE OF SUBJECTS WITH FEVER

Demographic variables		Group			
		Experiment		Control	
		No. of subjects	%	No. of subjects	%
Age	20 -30 yrs	19	63.3%	15	50.0%
	31 -40 yrs	2	6.7%	6	20.0%
	41 -50 yrs	4	13.3%	5	16.7%
	51 -60 yrs	5	16.7%	4	13.3%
Sex	Male	15	50.0%	20	66.7%
	Female	15	50.0%	10	33.3%
Religion	Hindu	22	73.3%	23	76.7%
	Christian	3	10.0%	5	16.7%
	Muslim	5	16.7%	2	6.7%
Education	Illiterate	6	20.0%	6	20.0%
	Primary	2	6.7%	8	26.7%
	Secondary	4	13.3%	5	16.7%
	Diploma	9	30.0%	6	20.0%
	Degree	9	30.0%	5	16.7%
Occupation	Unemployed	14	46.7%	9	30.0%
	Government	3	10.0%	3	10.0%
	Private	8	26.7%	9	30.0%
	Self	5	16.7%	9	30.0%
Income	< Rs.1000	10	33.3%	12	40.0%
	Rs.1000 -4000	10	33.3%	8	26.7%
	Rs.4001 -7000	6	20.0%	6	20.0%
	Rs.7001 -10000	1	3.3%	2	6.7%
	>Rs.10000	3	10.0%	2	6.7%
Marital status	Unmarried	14	46.7%	14	46.7%
	Married	15	50.0%	13	43.3%
	Divorced	0	0.0%	1	3.3%
	Widow	1	3.3%	2	6.7%
Diet pattern	Vegetarian	11	36.7%	7	23.3%
	Non-vegetarian	19	63.3%	23	76.7%

Table 2 shows the demographic information of subjects those who are participated for the following study on "A study to assess the effectiveness of hot water foot bath therapy in reducing body temperature among subjects with fever in medical wards in Rajiv Gandhi Government General Hospital, Chennai-03"

In the experimental group , majority of the subject are male 50% (15) between 20-30 years of age 63.3%(19), belonging to Hindu religion 73.3% (22) , students 30% (9) diploma & degree of each , 50% (15) of them are married, 46.7% (14) of them are unemployed and 63.3% (19) of them take non vegetarian diet.

In the control group , majority of the subject are male 66.7%(20) and between 20-30 years of age 50%(15), belonging to Hindu religion 76.7% (23) , students 26.7% (8) primary education, 46.7% (14) of them are unmarried, 30% (9) of them are unemployed as students and 76.7% (23)of them take non vegetarian diet.

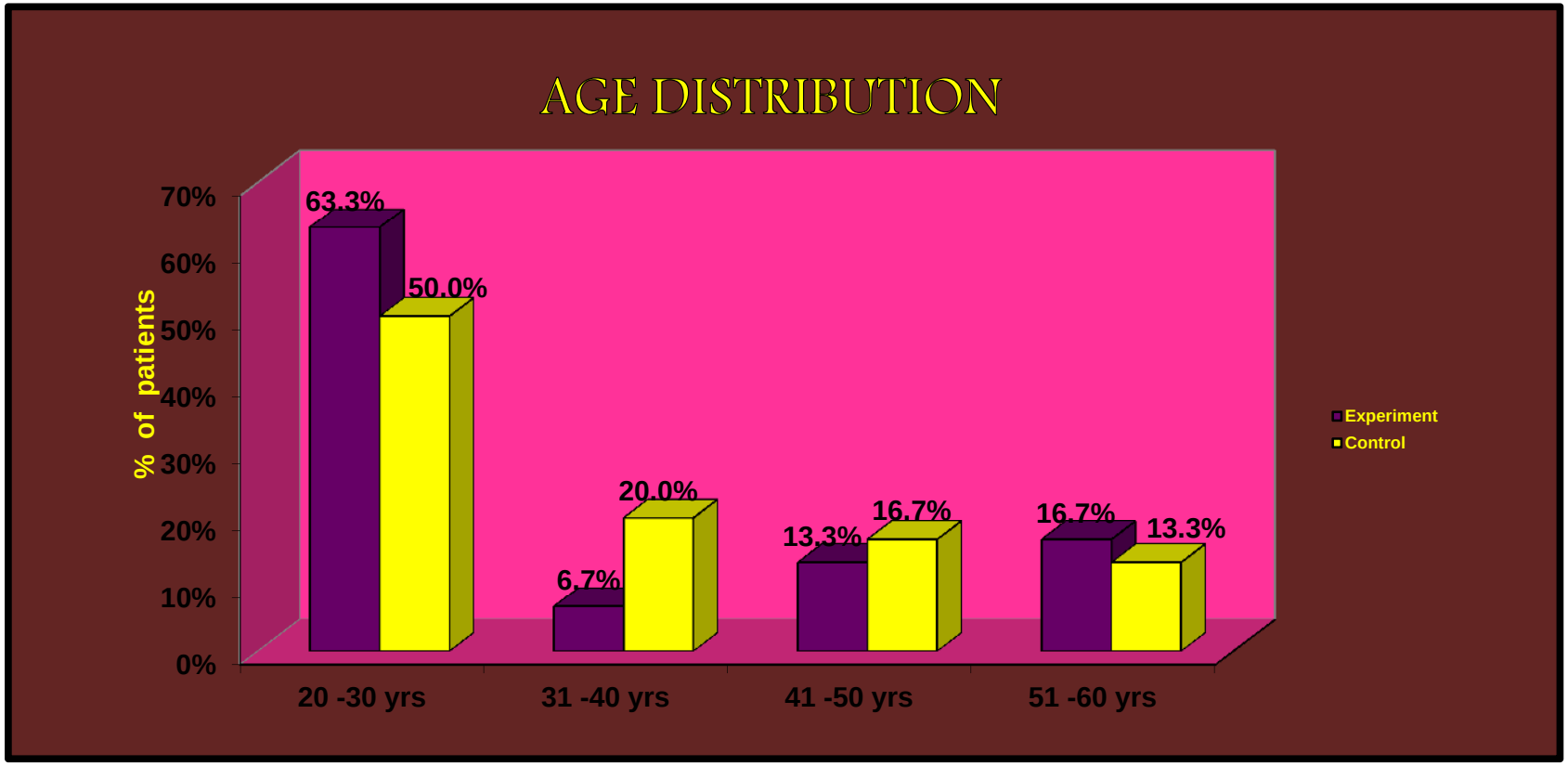


Figure - 4 : Distribution of age of subjects with fever.

Above figure shows that in experimental group most of (63.3%) the subject are below 30 years of age and in control group most of them (50%) are below 30 years of age.

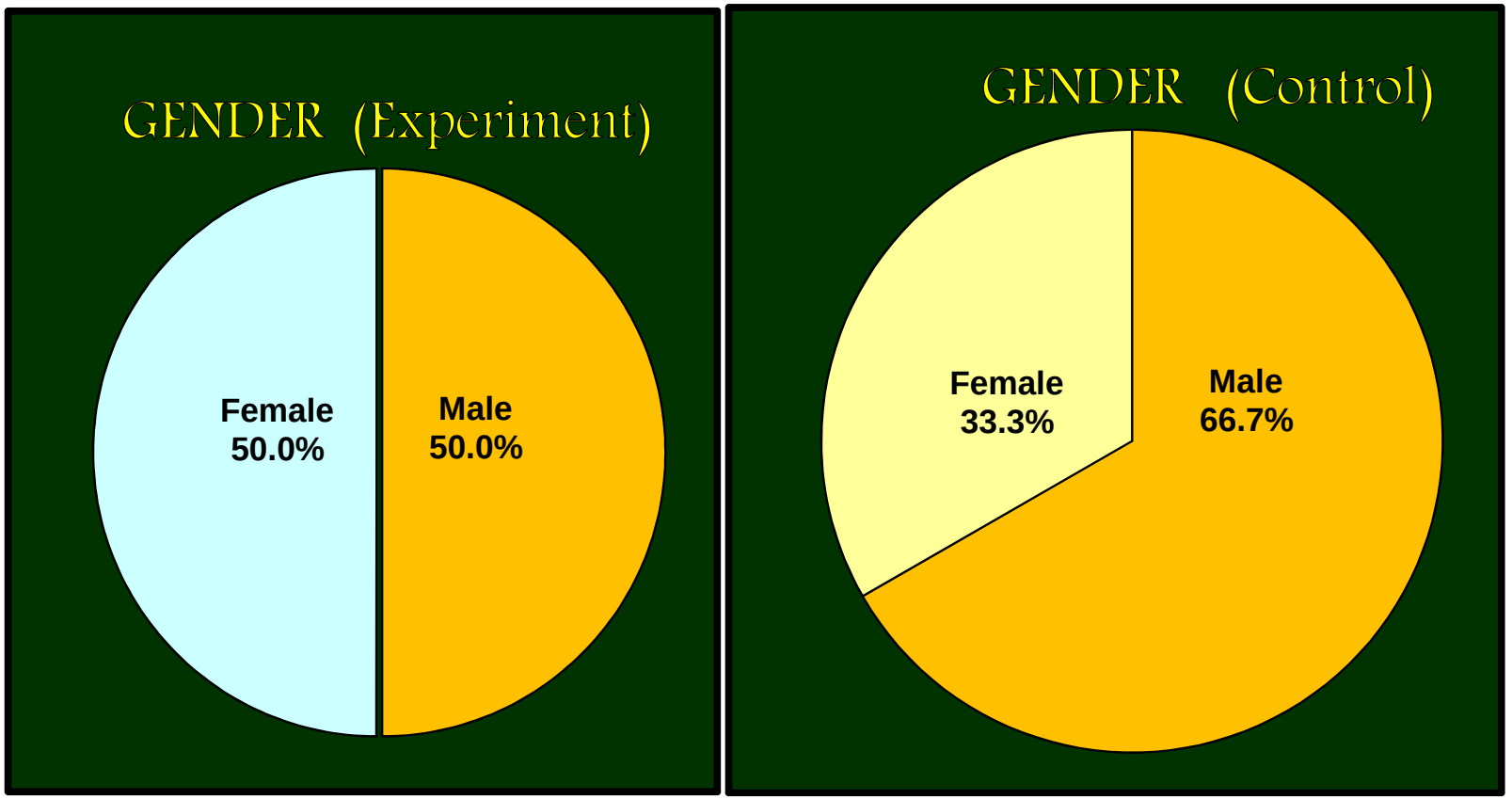


Figure -5 : Distribution of gender of subjects with fever.

Above figure shows that in a experimental group, 50% of the subject are male and in control group 66.7% of the subject are male

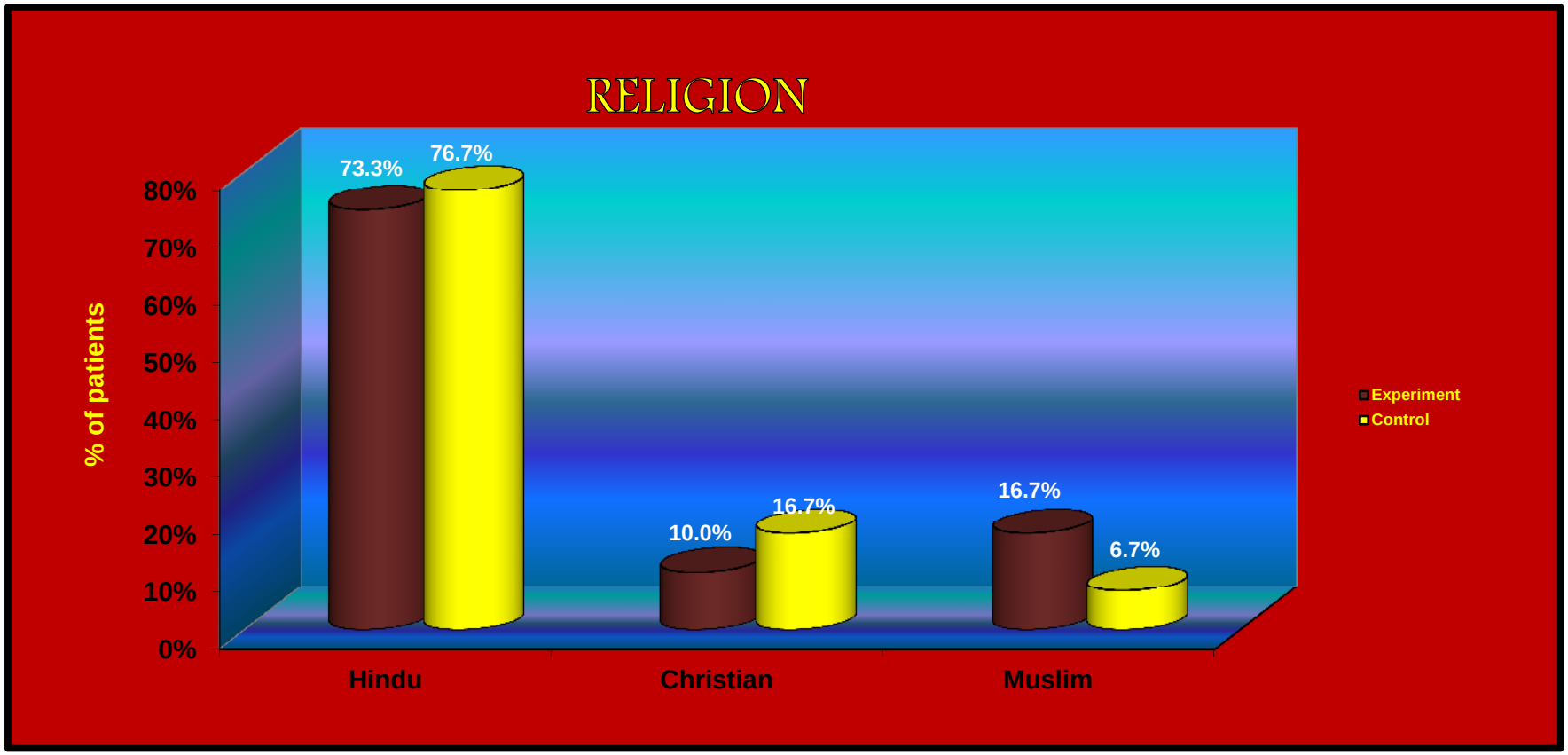


Figure-6: Distribution of the religion of the subjects with fever.

Above figure shows that in a experimental group, 73.3% of the subject are Hindu and 76.7% of the subject in control group are Hindu.

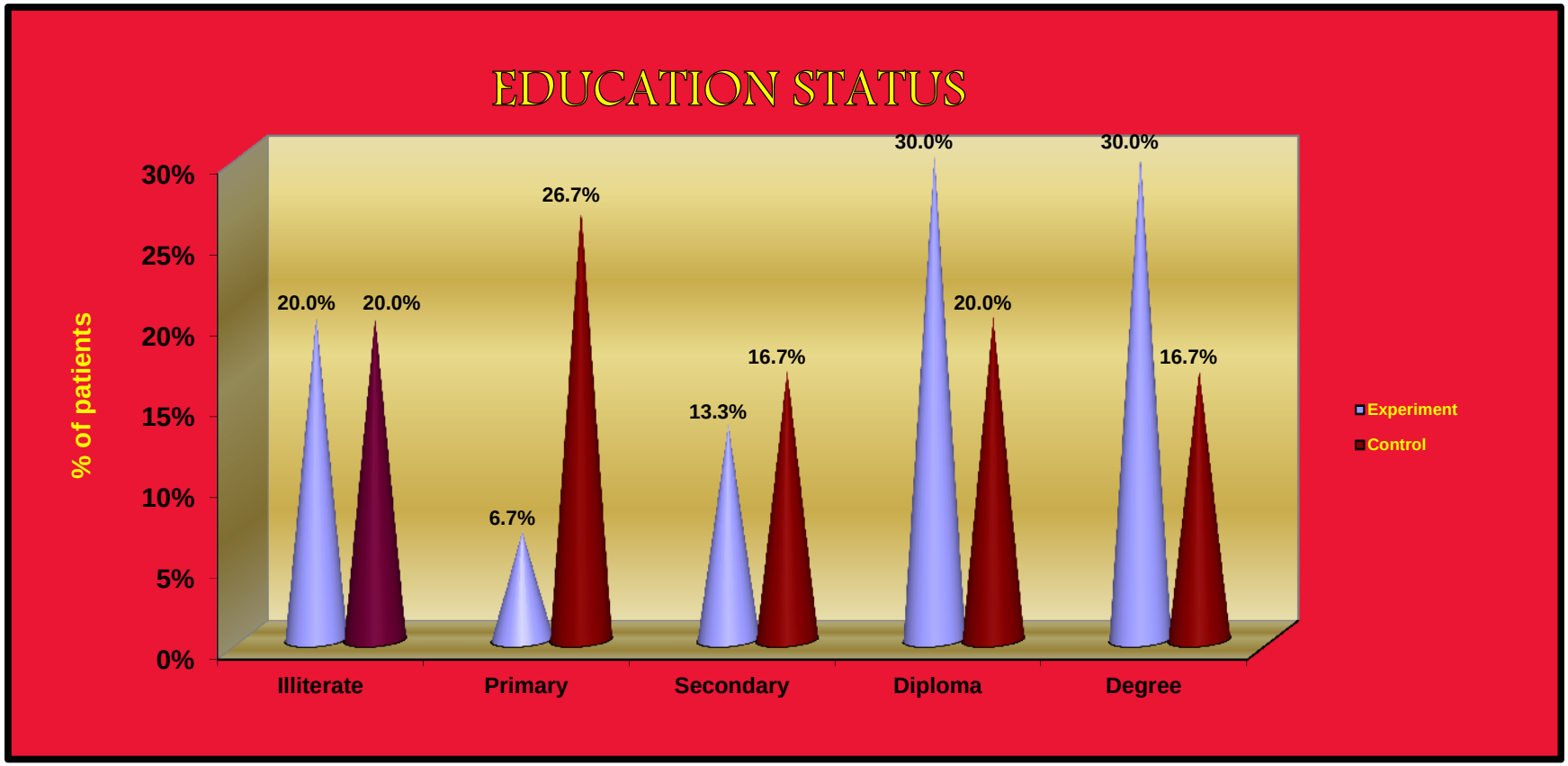


Figure-7: Distribution of the educational status the subjects with fever

Above figure shows that in a experimental group, 60% of the subject are students and 26.7% of the subject in control group are primary education.

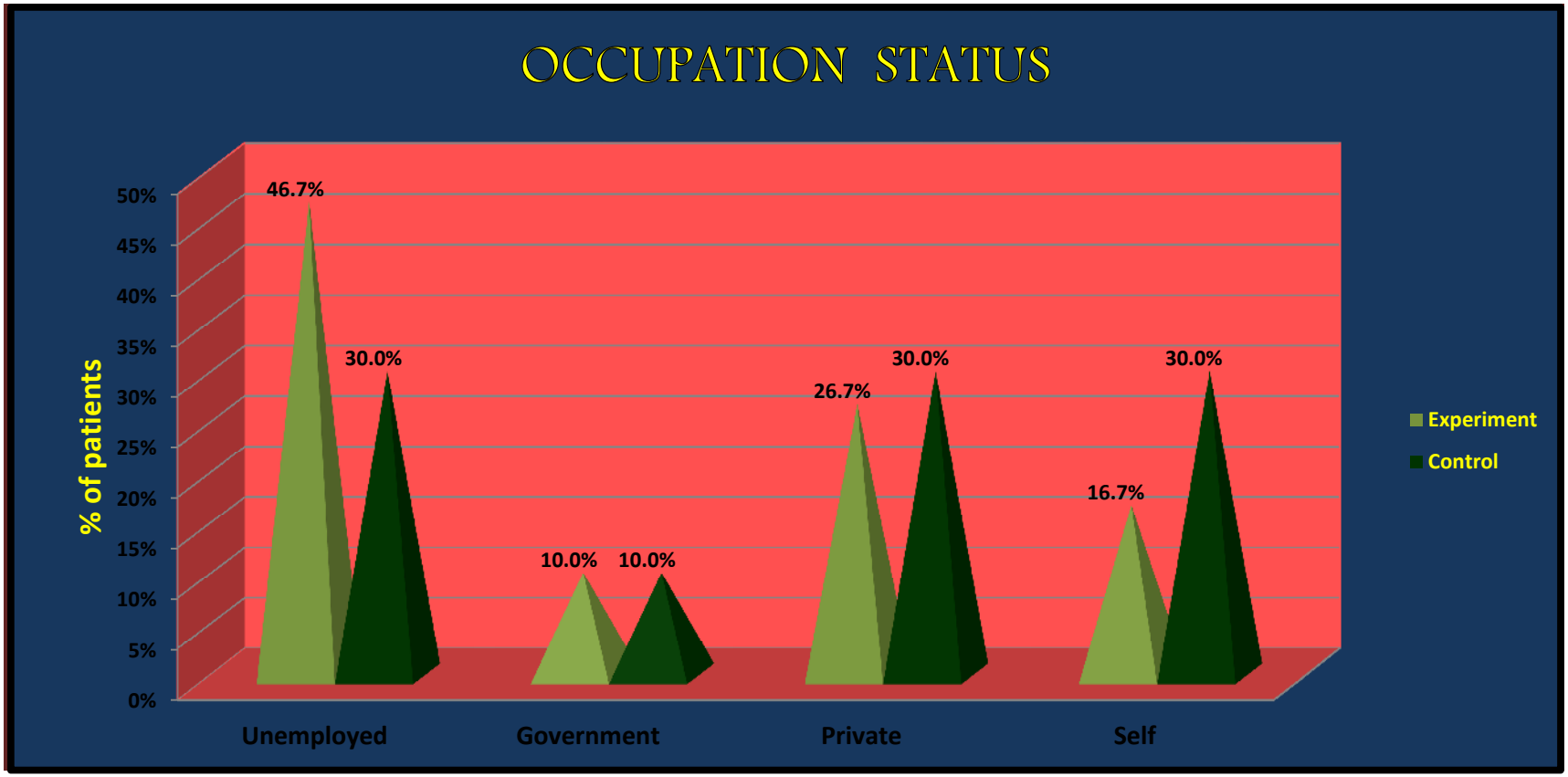


Figure-8: Distribution of the occupational status the subject with fever

Above figure shows that in a experimental group, 46.7% of the subject are students and 30% of the subject in control group are students.

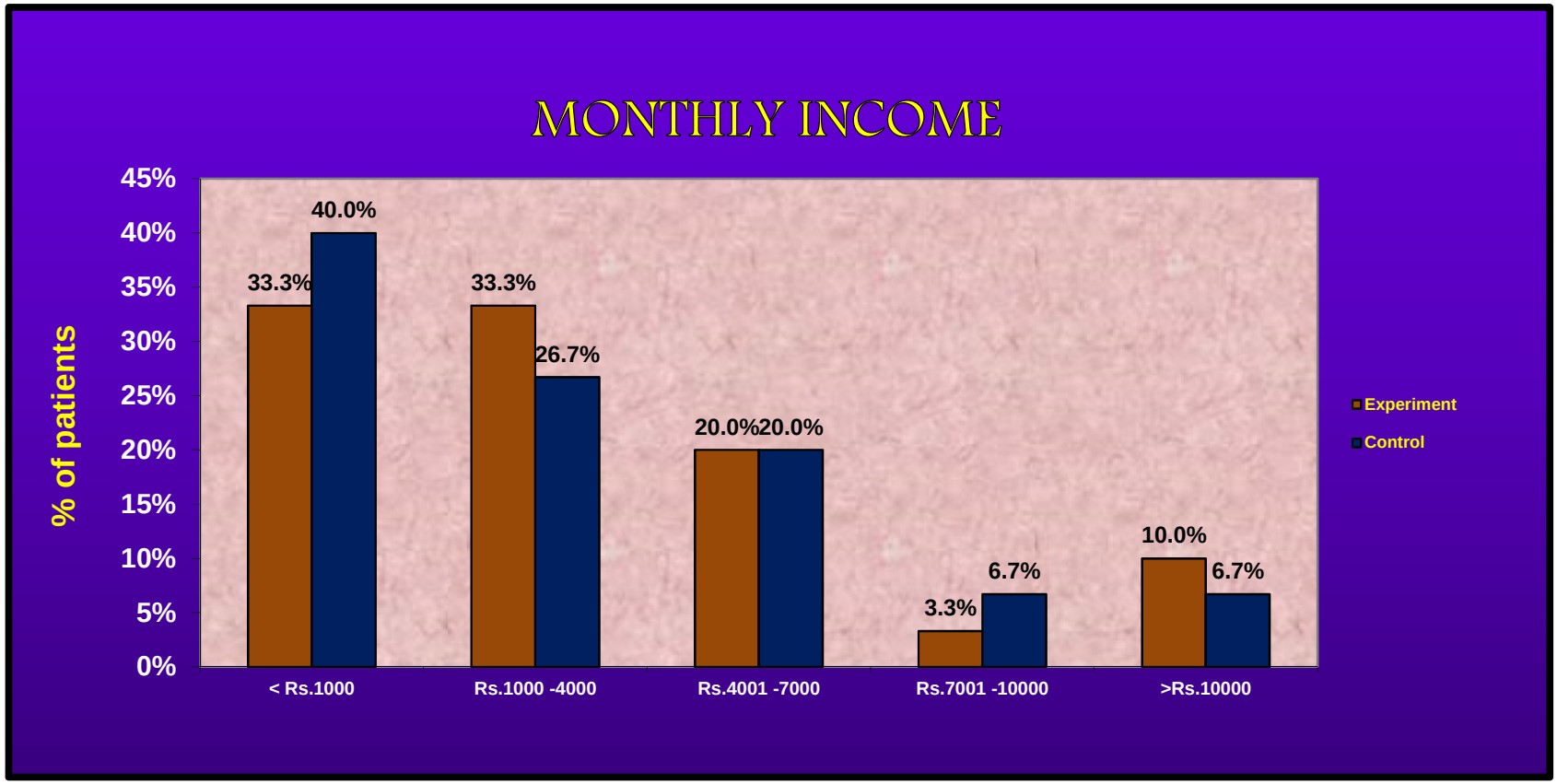


Figure-9: Distribution of the Monthly income of the subject with fever

Above figure shows that in a experimental group, 33.3% of the subject are < Rs.1000and 40% of the subject in control group are < Rs. 1000.

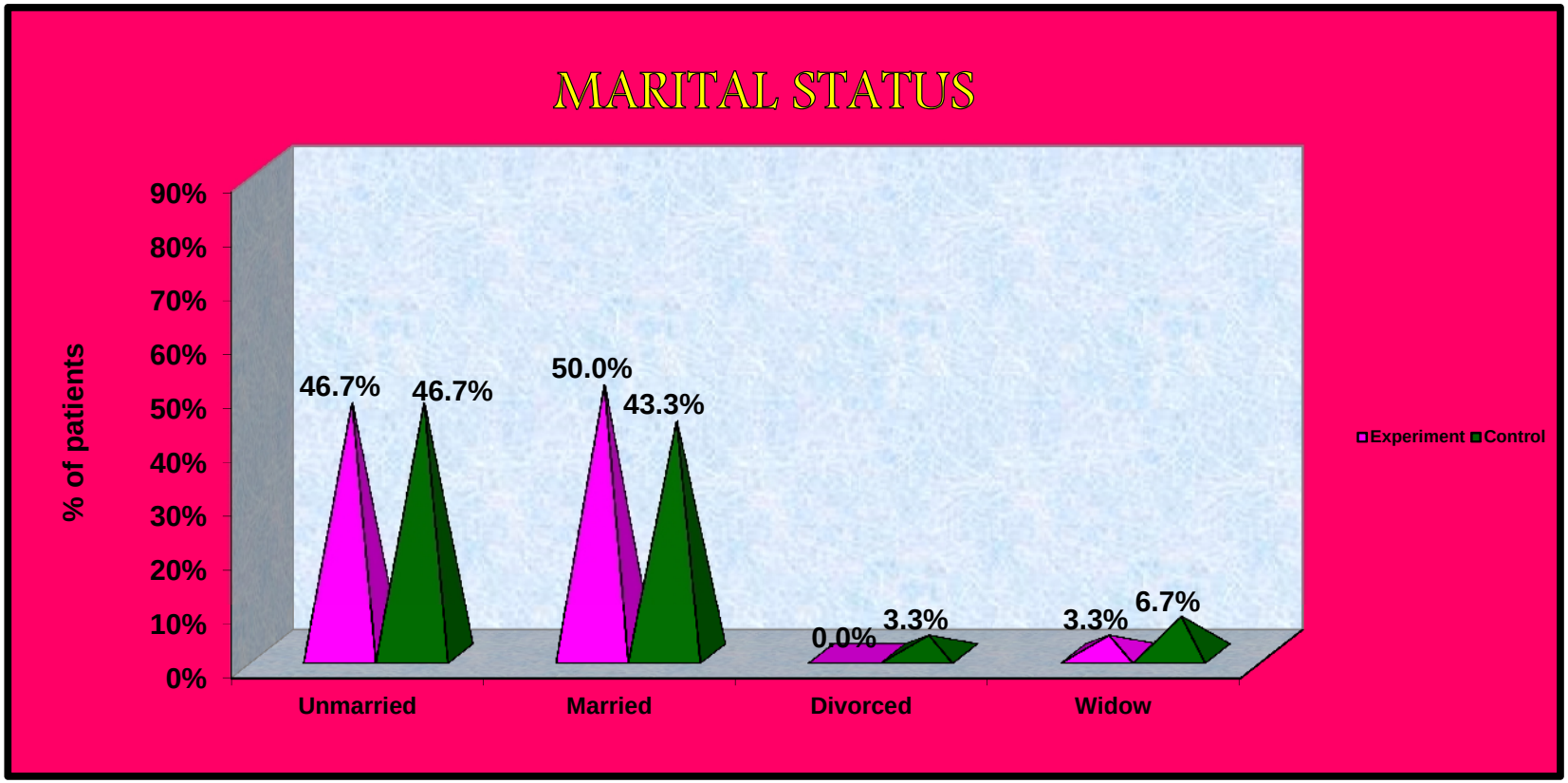


Figure-10: Distribution of the Marital status of the subjects with fever

Above figure shows that in a experimental group, 50% of the subject are married and 46.7% of the subject in control group are unmarried.

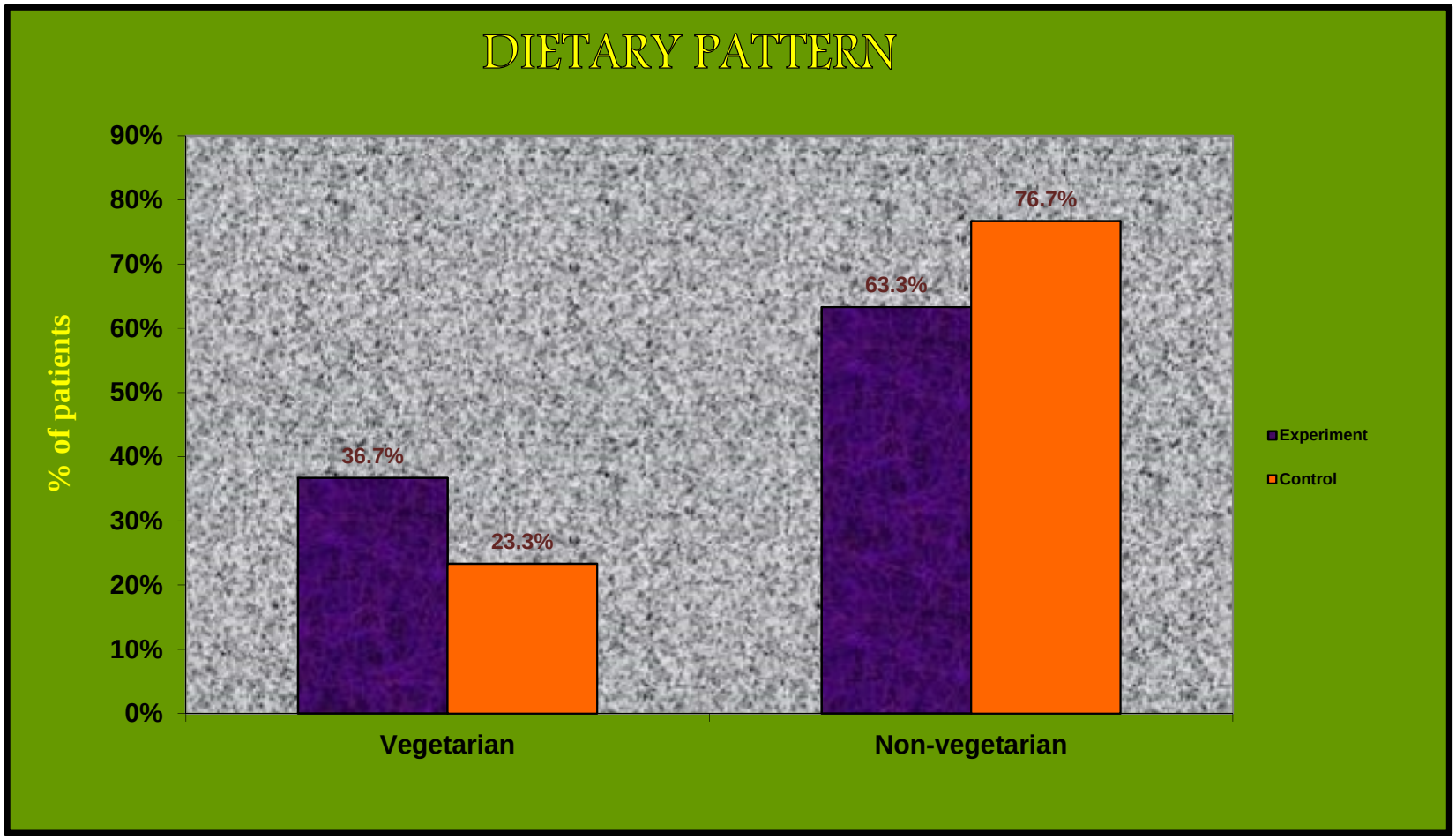


Figure-11: Distribution of the dietary pattern of the subject with fever

Above figure shows that in a experimental group, 63.3% of the subject are non vegetarian and 76.7% of the subject in control group are Non vegetarian.

TABLE 3: MEDICAL RELATED INFORMATION OF SUBJECTS WITH FEVER

Medical related variables		Group			
		Experiment		Control	
		N	%	N	%
Body temperature	100^0F	6	20.0%	8	26.7%
	101^0F	9	30.0%	8	26.7%
	102^0F	9	30.0%	9	30.0%
	103^0F	6	20.0%	5	16.7%
Durationof fever	Since last night	2	6.7%	4	13.3%
	Past 1 day	2	6.7%	6	20.0%
	Past 2 days	13	43.3%	12	40.0%
	Past 1 week	13	43.3%	8	26.7%
Previous history of hospitalization	Yes	7	23.3%	5	16.7%
	No	23	76.7%	25	83.3%
No. of time hospitalised	One time	3	42.9%	2	40.0%
	Two times	4	57.1%	3	60.0%
Associated symptoms with fever	Vomiting	10	33.3%	6	20.0%
	Chills	1	3.3%	3	10.0%
	Rigor	3	10.0%	0	0.0%
	Fatigue	1	3.3%	4	13.3%
	Eye congestion	2	6.7%	2	6.7%
	Body pain	1	3.3%	0	0.0%
	Combination	12	40.0%	15	50.0%

Table 3 shows the medical related information of subjects those who are participated in this study.

In the experimental group , majority of the subject 30% (9) have 101^0F & 102^0F each and 43.3% (13) have duration of fever of past 2 days and past 1 week each.76.7% (23) of them have no previous history of hospitalization. 40% (12) of them have associated illness.

In the control group , majority of the subject 30% (9) have 102^0F and 40% (12) have duration of fever of past 2 days.83.3% (25) of them have no previous history of hospitalization. 50% (15) of them have associated illness.

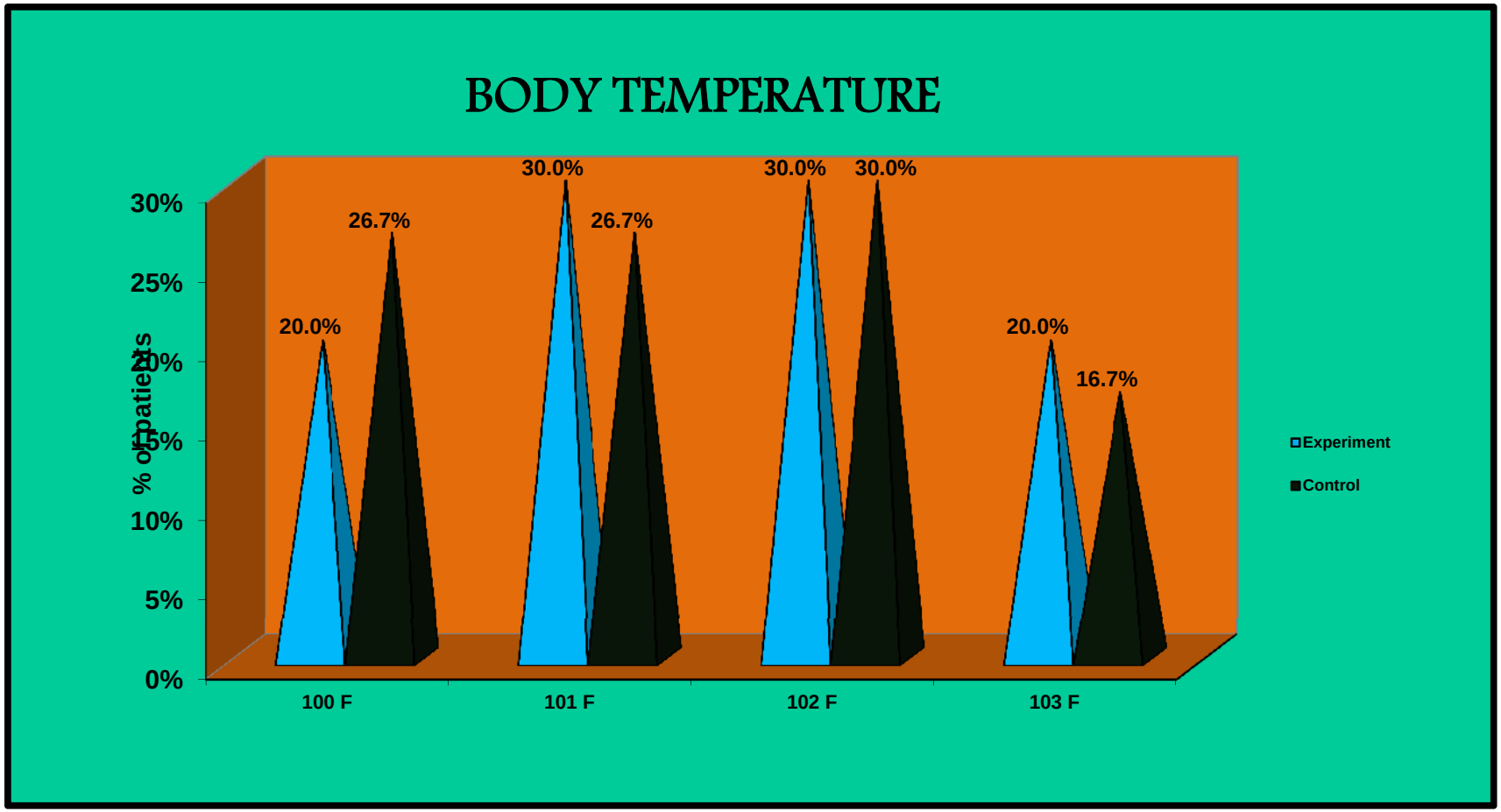


Figure-12: Distribution of the body temperature of the subjects with fever

Above figure shows that in a experimental group, 30% of the subject are having 101^0 F and 102 ^{o} F 26.7% of the subject in control group 30% of the subject are having 102 ^{0} F.

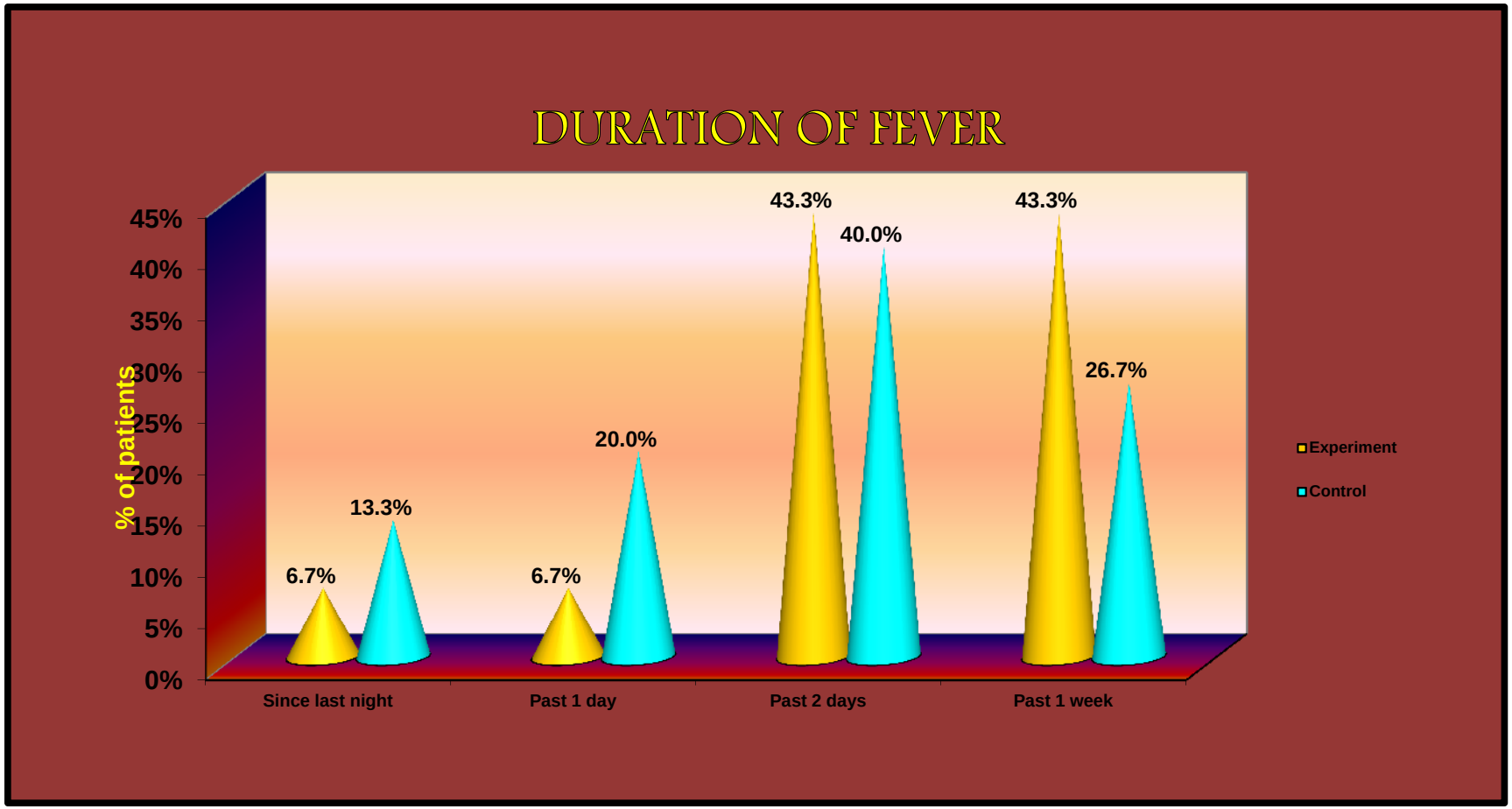


Figure-13: Distribution of the subjects with duration of fever

Above figure shows that in a experimental group, 43.3% of the subject are having fever for past 2 days and 43% with past 1 week and 40% of the subject in control group are having fever for past 2 days.

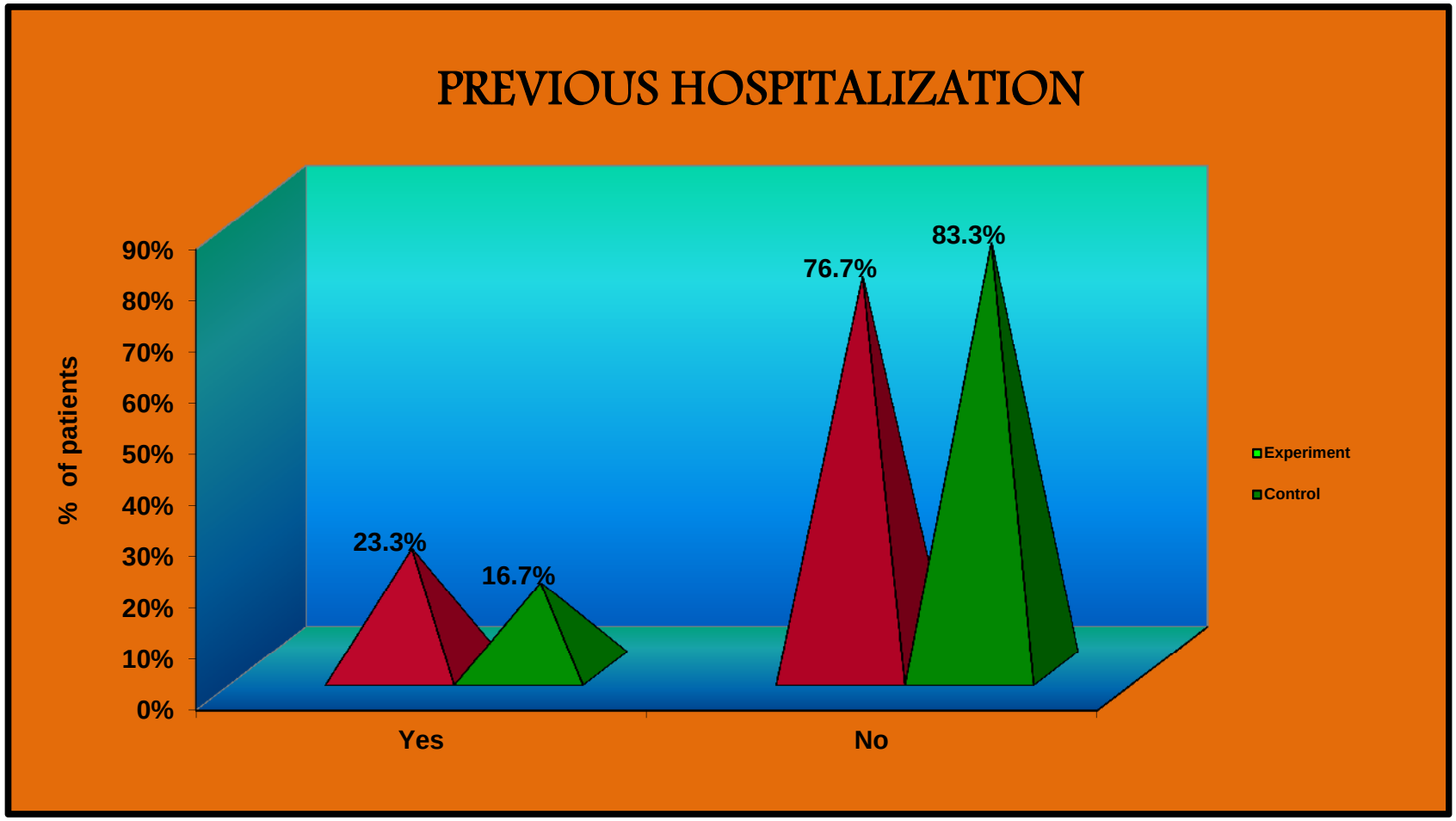


Figure-14: Distribution of the previous hospitalization of the subjects with fever

Above figure shows that in a experimental group, 76.7% of the subject have no previous of Hospitalization and 83.3% of the subject in control group have no previous history of hospitalization..

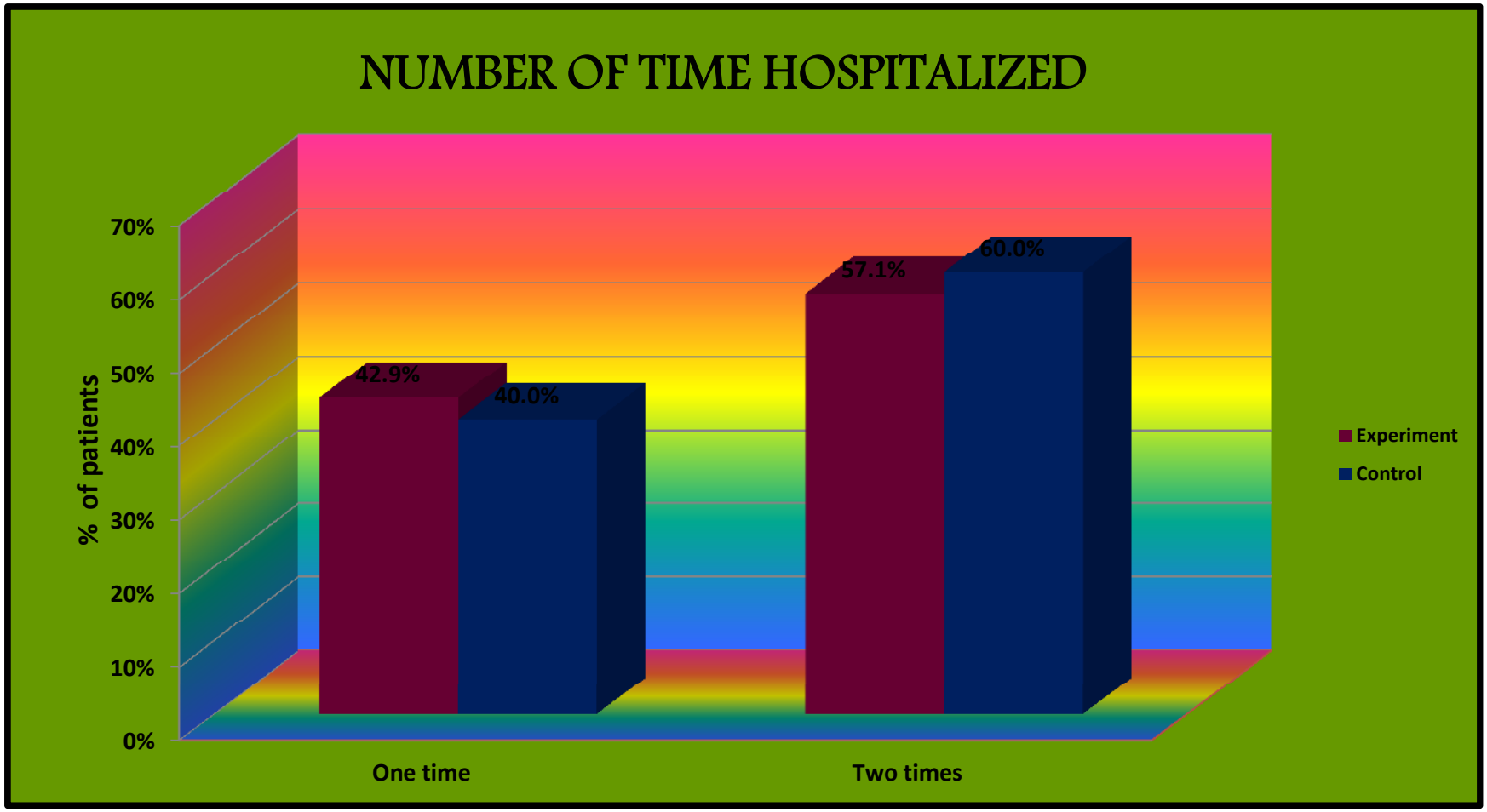


Figure-15: Distribution of the number of hospitalization of the subjects with fever

Above figure shows that in experimental group, 60% of the subject are admitted twice and 57.1% of the subject in control group are admitted twice.

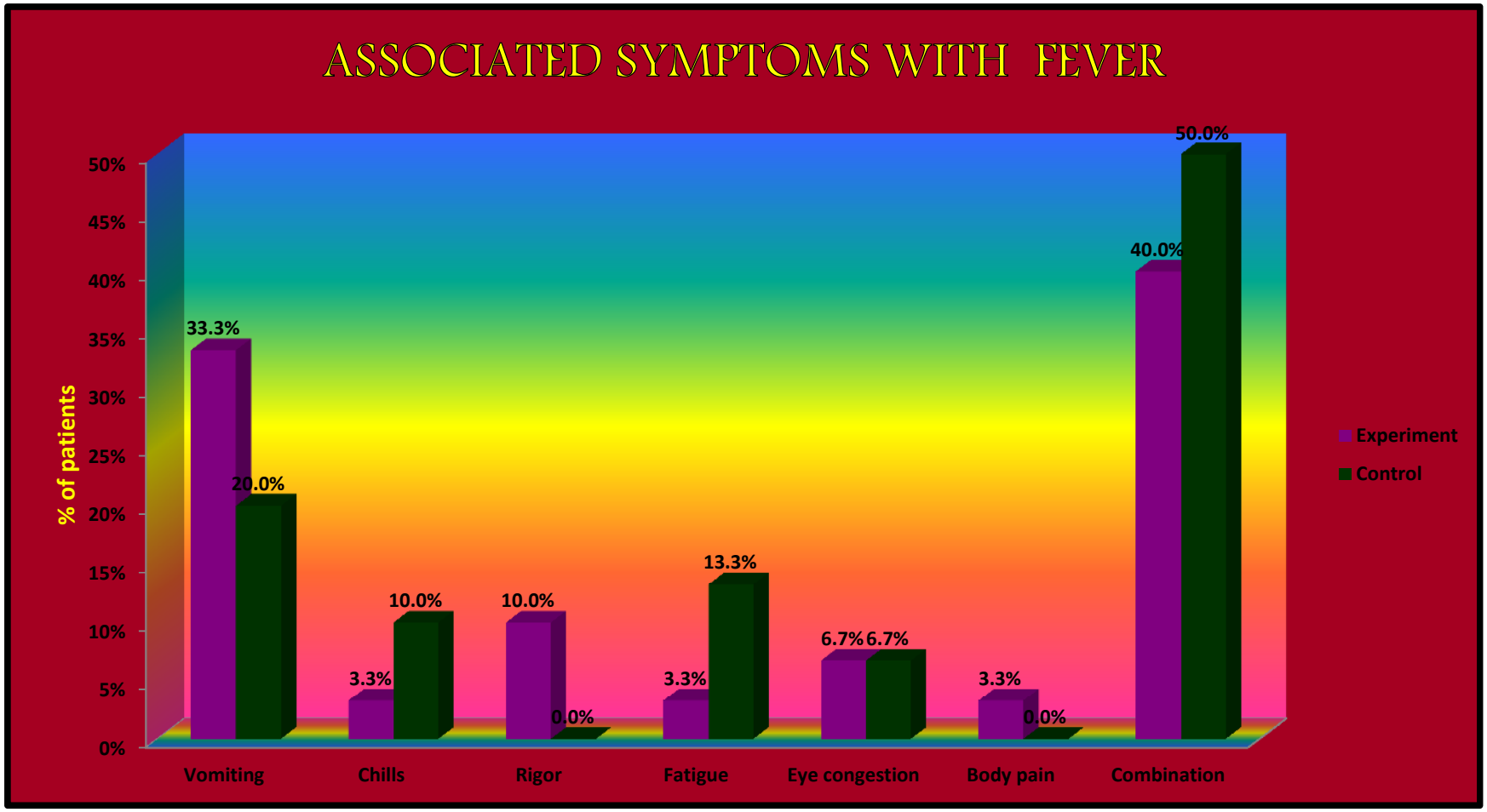


Figure-16: Distribution of the associated symptoms for the subjects with fever

Above figure shows that in a experimental group, 40% of the subject are having combination of symptoms and 50% of the subject in control group are having combination of symptoms.

Section B : Assessment of changes in body temperature of the subjects before hot water foot bath therapy in experimental group.

TABLE 4: PRE ASSESSMENT OF BODY TEMPERATURE

	No. of subjects	**Mean ± SD**	**Student's independent t-test**
Experiment	30	101.45±1.07	t=0.41 P=0.68
Control	30	101.33±1.06	not significant

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table no 4 shows the comparison of pre assessment temperature between experiment and control subjects.

On an average, in pre assessment, experiment group subjects are having 101.45^0F and control group subjects are having 101.33^0F, difference is 0.11^0F. the difference between experiment and control temperature is small and it is not statistically significant.. Differences between experiment and control score was analyzed using independent t-test.

Section C : Assessment of changes in body temperature of the subjects after hot water foot bath therapy in experimental group.

TABLE 5: POST ASSESSMENT OF BODY TEMPERATURE

	No. of subjects	Mean ± SD	Student's independent t-test
Experiment	30	99.83±0.83	**t=3.96 P=0.001*** significant**
Control	30	100.80±1.00	

* Significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table no 5 shows the comparison of post assessment temperature between experiment and control subjects.

On an average, in post assessment, experiment group subjects are having 99.83^0F and control group subjects are having 100.80^0F. Difference is 0.94^0F. The difference between experiment and control temperature is large and it is statistically significant.. Differences between experiment and control score was analyzed using independent t-test.

Table 6: COMPARISON OF PRE ASSESSMENT AND POST ASSESSMENT OF BODY TEMPERATURE

	No. of subjects	Pre assessment	Post assessment	Paired t-test
		Mean ± SD	Mean ± SD	
Experiment	30	101.45±1.07	99.83±0.83	**t=10.24 P=0.001*** **
Control	30	101.33±1.06	100.80±1.00	**t=4.00 P=0.001*** **

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table no 6 shows the comparison of pre assessment and post assessment temperature.

On an average, in experiment group, in pre assessment, subjects are having 101.45^0F and in post assessment subjects are having 99.83^0F. Difference is 1.59^0F. The difference between pre assessment and post assessment temperature is large and it is statistically significant.. Differences between pre assessment and post assessment temperature was analyzed using paired t-test.

On an average, in control group, in pre assessment, subjects are having 101.33^0F and in post assessment subjects are having 100.80^0F. Difference is 0.53^0F. The difference between pre assessment and post assessment temperature is large and it is statistically significant.. Differences between pre assessment and post assessment temperature was analyzed using paired t-test.

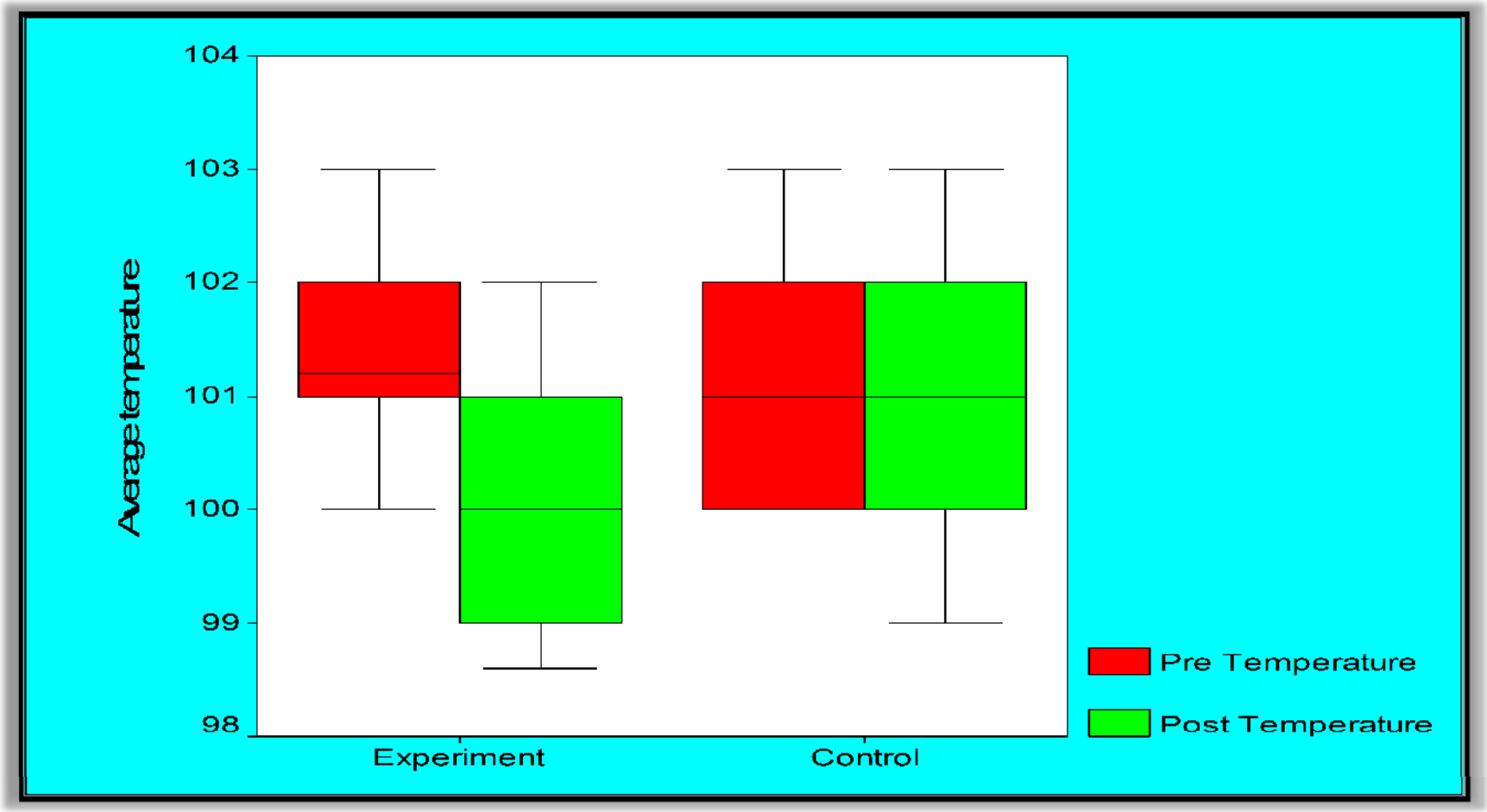


Figure -17: Comparison of mean body temperature score between pre assessment & post assessment

Boxplot compares the pre assessment and post assessment mean temperature score between Experimental and Control group

Table 7: COMPARISON OF EXPERIMENT AND CONTROL GROUP BODY TEMPERATURE

	No. of subjects	Experiment	Control	Independent t-test
		Mean ± SD	Mean ± SD	
Pre assessment	30	101.45±1.07	101.33±1.06	t=0.41 P=0.68
Post assessment	30	99.83±0.83	100.80±1.00	**t=3.96 P=0.001*** **

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001.

Table no 7 shows the comparison of pre assessment and post assessment temperature.

On an average, in pre assessment, experiment group subjects are having 101.45^0F and control group subjects are having 101.33^0F. Difference is 0.11^0F. The difference between experiment and control temperature is small and it is not statistically significant.. Differences between experiment and control score was analyzed using independent t-test.

On an average, in post assessment, experiment group subjects are having 99.83^0F and control group subjects are having 100.80^0F. Difference is 0.94^0F. The difference between experiment and control temperature is small and it is not statistically significant.. Differences between experiment and control score was analyzed using independent t-test.

Section D : Comparison of the changes in body temperature of the subjects in both control and experimental group.

TABLE 8: OVERALL BODY TEMPERATURE REDUCTION

	Pre assessment temperature	**Post assessment temperature**	**Temperature reduction with 95% Confidence interval**
Experiment	101.45	99.83	1.59(1.27 – 1.90)
Control	101.33	100.80	0.53(0.26 – 0.81)

Table no 8 shows the comparison of overall Temperature score between pre assessment and post assessment.

On an average, After Hot water foot bath therapy, experiment group subjects are reduced 1.59^0F and control group subjects are reduced using routine treatment is 0.53^0F **.** Differences between pre assessment and post assessment score was analyzed using mean difference with 95% CI.

TABLE 9: EFFECTIVENESS OF HOT WATER FOOT BATH THERAPY

	Reduction in temperature	Difference between experiment and control group
Experiment	1.59^0F	1.06^0F
Control	0.53^0F	

Table 9 evaluate the effectiveness of hot water foot bath therapy in reducing body temperature among subjects with fever in medical wards

On an average, After hot water foot bath therapy, experimental group subjects are reduced 1.06^0F than control group subjects. **This is net benefit of hot water foot bath therapy in reducing body temperature**.

TABLE 10: NUMBER OF TIME HOT WATER THERAPY.

	No. of subjects	%
One time	24	80%
Two times	4	13.3%
Three times	2	6.7%
Total	30	-

Section E: Determination of changes in body temperature of the subjects in both control and experimental group with selected demographic variables.

TABLE 11: ASSOCIATION BETWEEN LEVEL OF BODY TEMPERATURE REDUCTION AND DEMOGRAPHIC VARIABLES (EXPERIMENT)

Demographic variables		Level of temperature reduction				Total	Chi square test
		Below average (< 1.59)		Above average (>1.59)			
		N	%	N	%		
Age	20 -30 yrs	13	68.4%	6	32.6%	19	**χ^2=8.58 P=0.04***
	31 -40 yrs	1	50.0%	1	50.0%	2	
	41 -50 yrs	1	25.0%	3	75.0%	4	
	51 -60 yrs	0	0.0%	4	100.0%	5	
Sex	Male	11	73.3%	4	26.7%	15	**χ^2=6.53 P=0.01****
	Female	4	26.7%	11	73.3%	15	
Religion	Hindu	11	50.0%	11	50.0%	22	χ^2=0.53 P=0.76
	Christian	1	33.3%	2	66.7%	3	
	Muslim	3	60.0%	2	40.0%	5	
Education	Illiterate	5	83.3%	1	16.7%	6	χ^2=6.77 P=0.14
	Primary	2	100.0%	-	-	2	
	Secondary	1	25.0%	3	75.0%	4	
	Diploma	4	44.4%	5	55.6%	9	
	Degree	3	33.3%	6	66.7%	9	
Occupation	Unemployed	7	50.0%	7	50.0%	14	χ^2=3.70 P=0.29
	Government	5	-	3	100.0%	3	
	Private	3	62.5%	3	37.5%	8	
	Self		60.0%	2	40.0%	5	
Income	< Rs.1000	6	60.0%	4	40.0%	10	χ^2=5.46 P=0.24
	Rs.1000-4000	4	40.0%	6	60.0%	10	
	Rs.4001-7000	4	66.7%	2	33.3%	6	
	Rs.7001-10000	-	100.0%	3		1	
	>Rs.10000	1			100.0%	3	
Marital status	Unmarried	5	35.7%	9	64.3%	14	χ^2=3.81 P=0.14
	Married	10	66.7%	5	33.3%	15	
	Widow	-		1	100.0%	1	
Diet pattern	Vegetarian	5	45.5%	6	54.5%	11	χ^2=0.14 P=0.70
	Non-vegetarian	10	52.6%	9	47.4%	19	

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

This shows the association between level of temperature reduction and their demographic variables. Elders, females are reduced more temperature than others. Statistical significance was calculated using chi square test.

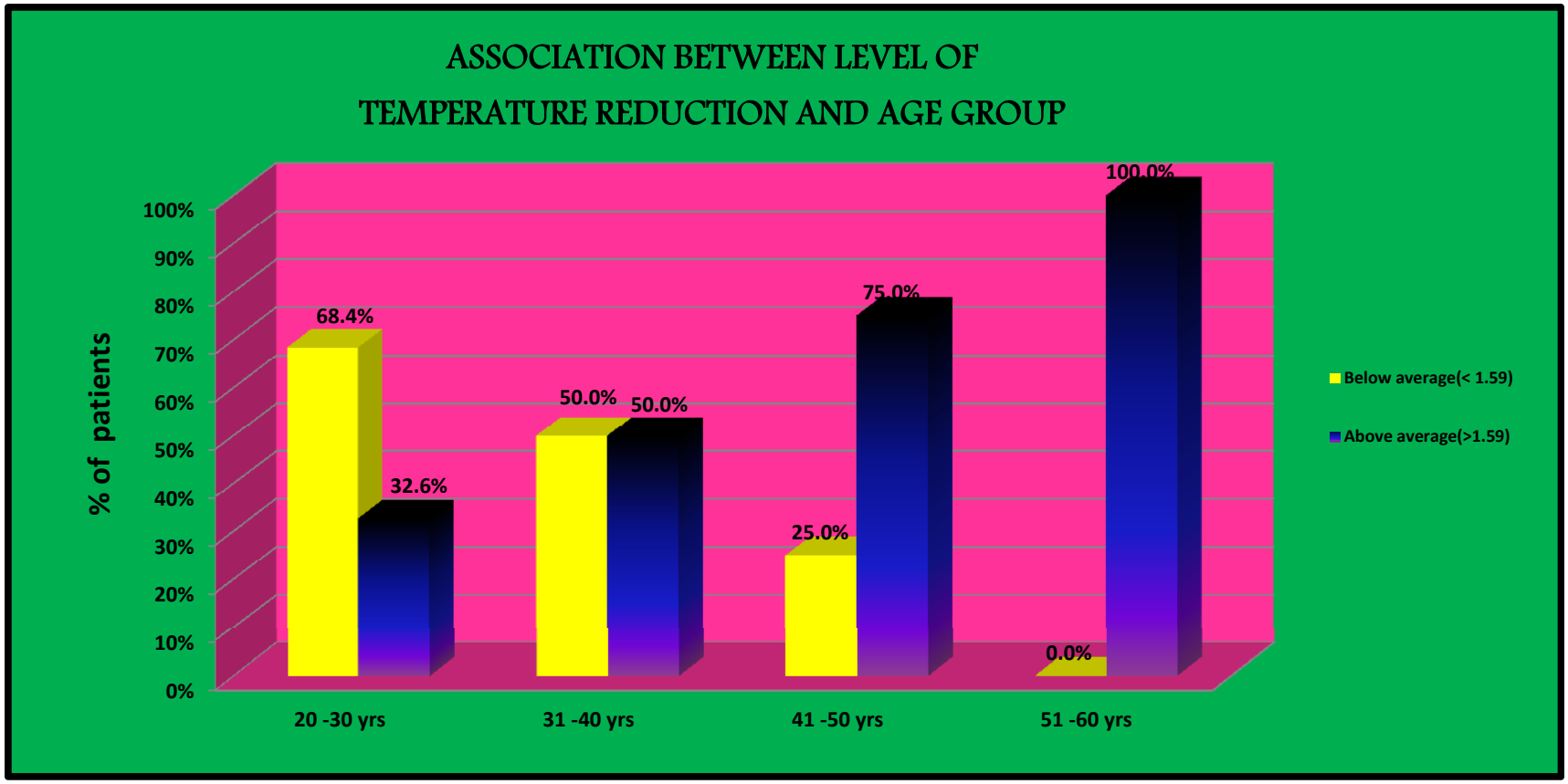


Figure-18: Association between level of temperature reduction and Age Group.

Above figure shows that association between level of temperature reduction and Age Group.

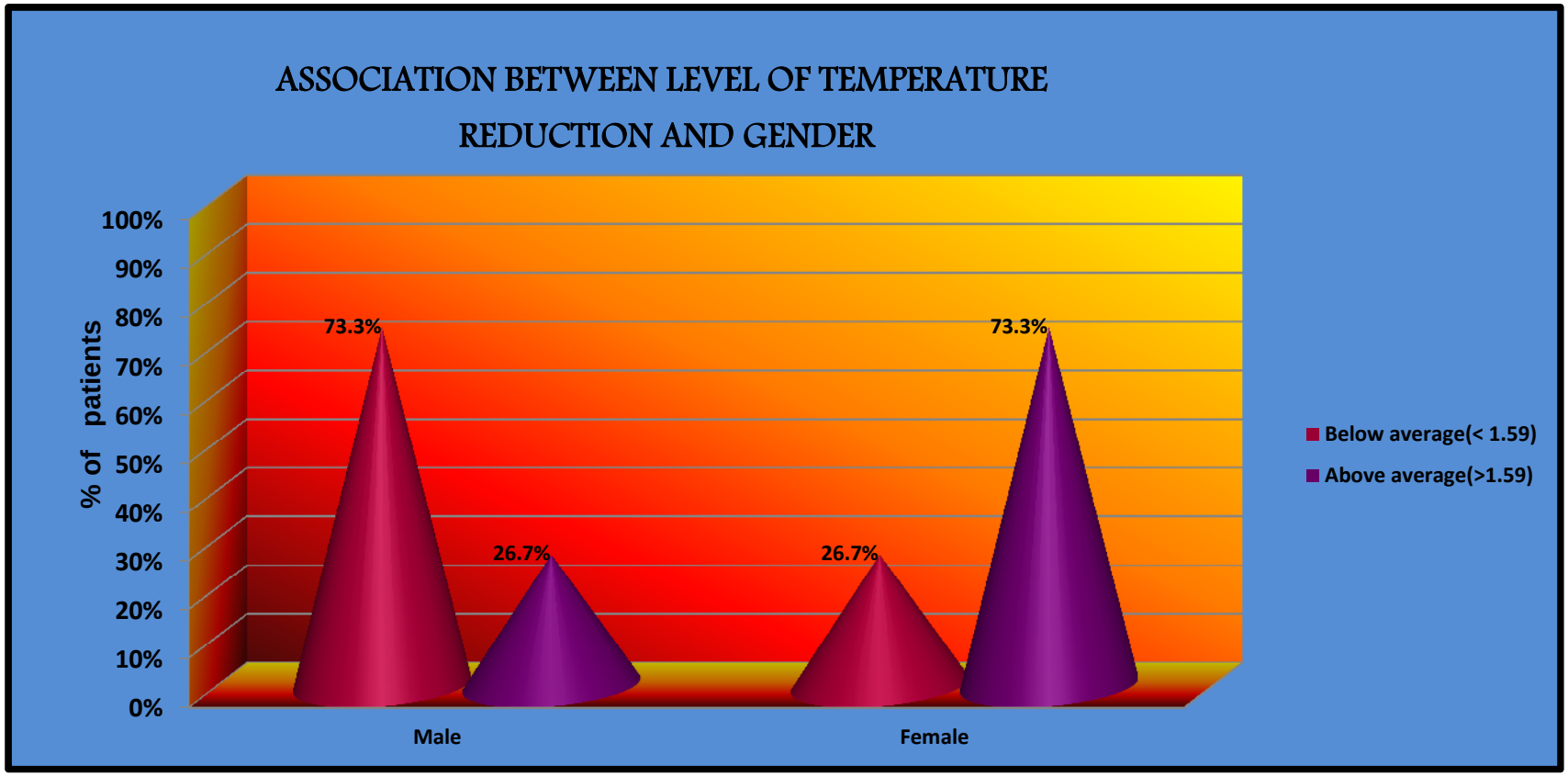


Figure-19: Association between level of temperature reduction and Gender

Above figure shows that association between level of temperature reduction and Gender.

TABLE 12: ASSOCIATION BETWEEN LEVEL OF BODY TEMPERATURE REDUCTION AND MEDICAL RELATED VARIABLES (EXPERIMENT)

Medical related variables		Level of temperature reduction				Total	Chi square test
		Below average (< 1.59)		Above average (>1.59)			
		N	%	N	%		
Body temperature	100 ^{0}F 101 ^{0}F 102 ^{0}F 103 ^{0}F	5 5 4 1	83.3% 55.6% 44.4% 16.7%	1 4 5 5	16.7% 44.4% 55.6% 83.3%	6 9 9 6	χ2=5.56P=0.13
Duration of fever	Since last night Past 1 day Past 2 days Past 1 week	0 0 5 10	0.0% 0.0% 38.5% 76.9%	2 2 8 3	100.0% 100.0% 61.5% 23.1%	2 2 13 13	**χ2=8.46 P=0.04***
Previous history of hospitalization	Yes No	3 12	42.9% 52.2%	4 11	57.1% 47.8%	7 23	χ2=0.18 P=0.66
No. Of time hospitalized	One time Two times	1 2	33.3% 50.0%	2 2	66.7% 50.0%	3 4	χ2=0.19 P=0.66
Associated symptoms with fever	Vomiting Chills Rigor Fatigue Eye congestion Body pain Combination	5 1 1 1 1 1 5	50.0% 100.0% 33.3% 100.0% 50.0% 100.0% 41.7%	5 2 1 7	50.0% 66.7% 50.0% 58.3%	10 1 3 1 2 1 12	χ2=3.66 P=0.72

* significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table no 12 shows the association between level of temperature reduction and their demographic variables. Less days fever subjects are reduced more temperature than others. Statistical significance was calculated using chi square test

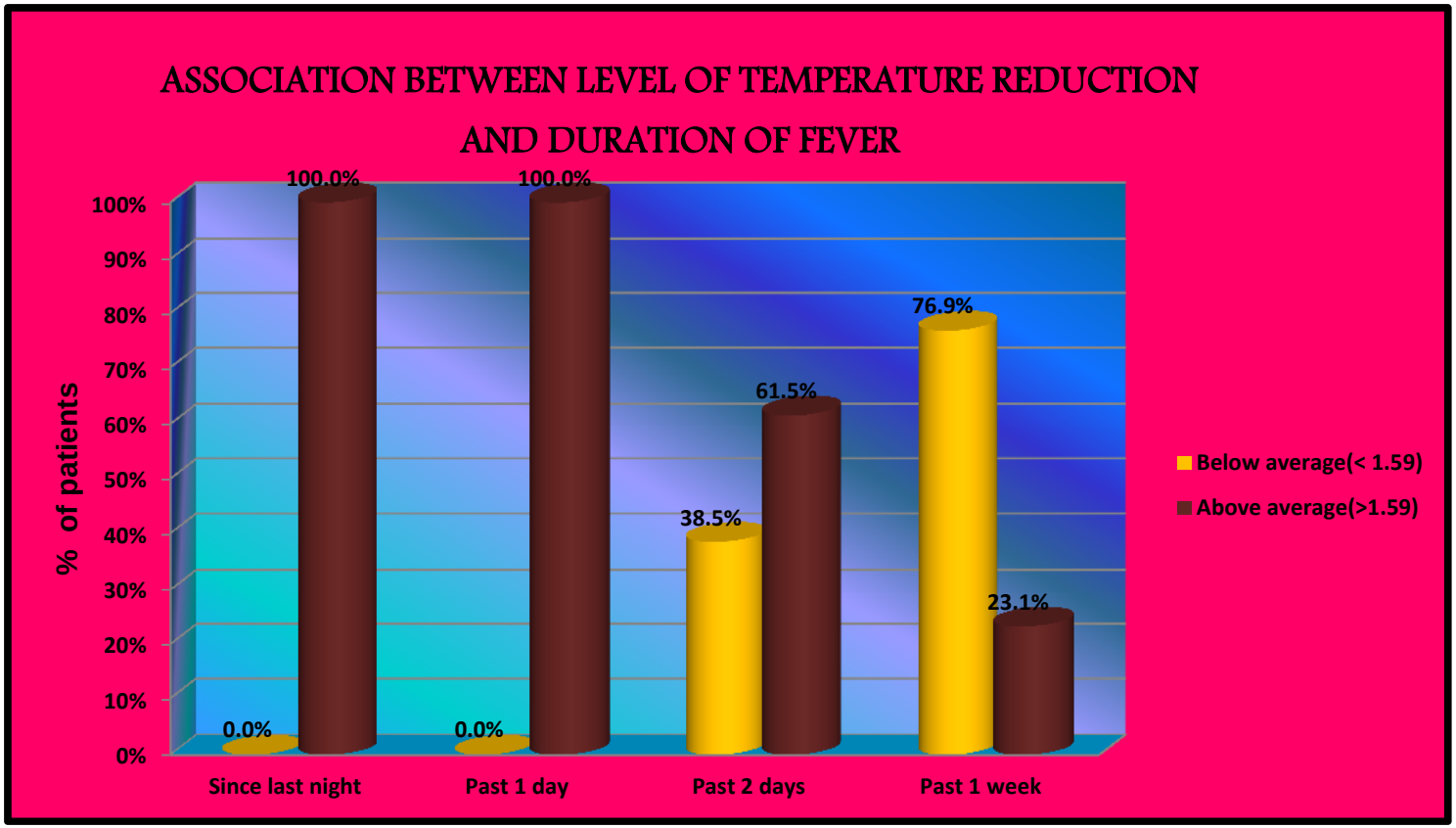


Figure-20: Association between level of temperature reduction and Duration of Fever.

Above figure shows that association between level of temperature reduction and Duration of Fever

TABLE 13: ASSOCIATION BETWEEN LEVEL OF BODY TEMPERATURE REDUCTION AND DEMOGRAPHIC VARIABLES (CONTROL)

Demographic variables		Level of temperature reduction				Total	Chi square test
		Below average (< 0.53)		Above average (>0.53)			
		N	%	N	%		
Age	20 -30 yrs	9	60.0%	6	40.0%	15	χ^2=4.46 P=0.21
	31 -40 yrs	1	16.7%	5	83.3%	6	
	41 -50 yrs	2	40.0%	3	60.0%	5	
	51 -60 yrs	3	75.0%	1	25.0%	4	
Sex	Male	9	45.0%	11	55.0%	20	χ^2=0.60 P=0.43
	Female	6	60.0%	4	40.0%	10	
Religion	Hindu	12	52.2%	11	47.8%	23	χ^2=0.24 P=0.88
	Christian	2	40.0%	3	60.0%	5	
	Muslim	1	50.0%	1	50.0%	2	
Education	Illiterate	5	83.3%	1	16.7%	6	χ^2=5.83 P=0.21
	Primary	3	37.5%	5	62.5%	8	
	Secondary	2	40.0%	3	60.0%	5	
	Diploma	4	66.7%	2	33.3%	6	
	Degree	1	20.0%	4	80.0%	5	
Occupation	Unemployed	5	55.6%	4	44.4%	9	χ^2=3.33 P=0.34
	Government	-	-	3	100.0%	3	
	Private	5	55.6%	4	44.4%	9	
	Self	5	55.6%	4	44.4%	9	
Income	< Rs.1000	7	58.3%	5	41.7%	12	χ^2=4.80 P=0.31
	Rs.1001 -4000	5	62.5%	3	37.5%	8	
	Rs.4001 -7000	3	50.0%	3	50.0%	6	
	Rs.7001 -10000			2	100.0%	2	
	>Rs.10001			2	100.0%	2	
Marital status	Unmarried	8	57.1%	6	42.9%	14	χ^2=1.97 P=0.57
	Married	5	38.5%	8	61.5%	13	
	Divorced	1	100.0%	-	-	2	
	Widow	1	50.0%	1	50.0%		
Diet pattern	Vegetarian	5	71.4%	2	28.6%	7	χ^2=1.67 P=0.19
	Non-vegetarian	10	43.5%	13	56.5%	23	

Table no 13 shows the association between level of temperature reduction and their demographic variables. None of the variables are significantly associated

with their reduction of temperature. Statistical significance was calculated using chi square test.

TABLE 14: ASSOCIATION BETWEEN LEVEL OF BODY TEMPERATURE REDUCTION AND MEDICAL RELATED VARIABLES (CONTROL)

Medical related variables		Level of temperature reduction				Total	Chi square test
		Below average (< 0.53)		Above average (>0.53)			
		N	%	N	%		
Body temperature	100^0F	6	75.0%	2	25.0%	8	$\chi 2=3.91$ P=0.27
	101^0F	4	50.0%	4	50.0%	8	
	102^0F	4	44.4%	5	55.6%	9	
	103^0F	1	20.0%	4	80.0%	5	
Duration of fever	Since last night	3	75.0%	1	25.0%	4	$\chi 2=3.33$ P=0.34
	Past 1 day	3	50.0%	3	50.0%	6	
	Past 2 days	7	58.3%	5	41.7%	12	
	Past 1 week	2	25.0%	6	75.0%	8	
Previous history of hospitalization	Yes	2	40.0%	3	60.0%	5	$\chi 2=0.24$ P=0.62
	No	13	52.0%	12	48.0%	25	
No. Of time hospitalized	One time	1	50.0%	1	50.0%	2	$\chi 2=0.13$ P=0.71
	Two times	1	33.3%	2	66.7%	3	
Associated symptoms with fever	Vomiting	3	50.0%	3	50.0%	6	$\chi 2=4.06$ P=0.39
	Chills	3	100.0%	-	-	3	
	Fatigue	1	25.0%	3	75.0%	4	
	Eye congestion	1	50.0%	1	50.0%	2	
	Combination	7	46.7%	8	53.3%	15	

Table no 14 shows the association between level of temperature reduction and their demographic variables. None of the variables are significantly associated with their reduction of temperature. Statistical significance was calculated using chi square test.

Chapter –V

Discussion

CHAPTER - V

DISCUSSION

"Discussion is an exchange of knowledge ;argument is an exchange of ignorance"

- Robert Quillen

This chapter concentrates on the findings of this study derived from the statistical analysis and its pertinence to the objectives set for the study. The purpose of the study was " to assess the effectiveness of hot water foot bath therapy in reducing body temperature among subjects with fever in medical wards in Rajiv Gandhi Government General Hospital, Chennai-03".

60 subjects between the age group of 20 to 60 years with fever were selected by simple random sampling – lottery method and assigned to Experimental group and control group 30 for each on the basis of inclusion criteria.

Semi structured questionnaire was used to gather information from the subjects of both group with fever. Body temperature and associated illness was assessed in both group before intervention. Then hot water foot bath therapy was given for experimental group And Hospital routine care procedure carried out for control group. After that post interventions, body temperature was assessed using the same tool (oral thermometer). Data collection was done with the permission of Institutional Ethics Committee.

The collected data was collected in three sections. **Section A** : Socio demographic data, **Section B :** Medical related information, **Section C :** oral thermometer. Data was verified and entered in the computer for processing.

Characteristics of the Demographic Variables

The characteristics of the demographic variables are described in the forms of frequency and percentage distribution.

Study result shows that most of the subjects are in the age group of 20 – 30 years (63.3%)(19) in experimental group and 50% (15) in control group respectively. Majority of the subjects are male 50% (15) in experimental group and 66.7%(20) in control group. Majority of the subjects belong to 73.3% (22)in experimental group and 76.7%(23) in control group.Majority of the subjects are diploma 30% (9) & degree holder 30% (9) in experimental group and primary education 26.7%(8) in control group respectively.

Majority of the subjects are unemployed 46.7% (14) in experimental group. It denotes that majority of the subject in both groups are students of 20 – 30 years of age. 33.3% (10) of the subjects in experimental group and 40 % (12) in control group, the monthly income is less than Rs.1000/-. It reveals that lower socio economic status also have a role in fever and its management.Majority of the subject 46.7% (14) in each of experimental group and control group are unmarried. Most of the subject are taking non vegetarian diet 63.3% (19) in experimental group and 76.7% (23) control group respectively.

Majority of the have body temperature 30 % (9) in experimental and control group. the duration of illness is about 43.3% (13) past 2 days and 43.3% (13) past 1 week and 40% (10) in control group respectively.Many subjects in both experimental group 76.6 % (23) and control group 83.3% (25) had no

history of hospitalization. Majority of the subjects have associated symptoms 40% (12) in experimental group and 50% (15) in control group.

The first objective of the study is to assess the body temperature of the patient before hot water foot bath therapy in both experimental and control group.

The investigator used oral thermometer for the assessment of body temperature among the subjects with fever.

The findings of the study shows that the overall temperature score was high and associated symptoms are high in both groups in pre assessment. In experimental group, 30% (9) subjects are having 102^0F and 30% (9) had 101^0F 20% (6) had 103^0F and 20% (6) had 100^0F. In control group, 30% (9) had 102^0F, 26.7% (8) had 100^0F, 26.7% (8) had 101^0F and 16.7% (5) had 103^0F . the mean temperature score was 101.45F in experimental group and 101.33F in control group and the difference is 0.11^0F. the difference is small and it is not statistically significant.

Considering associated symptoms, in experimental group, 33.3%(10) are having vomiting, 10% (3) are having fatigue and 6.7% (2) are having eye congestion. In control group, 20% (6) are having vomiting, 13.3 % (4) are having fatigue and 6.7% (2) are having eye congestion. The mean associated symptom score was 40% in experimental group and 50% in control group.

Thus it is evident that in pre assessment, there is no statistically significant difference between experimental and control group temperature measurements.

Therefore, statistically, the results suggest that there is increased temperature and associated symptoms among subjects with fever. Therefore

there is a need for systemic evaluation of temperature to initiate temperature reduction measures.

The second objective is to assess the body temperature of the patient after hot water foot bath therapy in experimental group.

In the experimental group, on an average, the post assessment mean temperature score was 99.83 ^{O}F with the standard deviation 0.83 and in control group, the post assessment mean temperature was 100.80 ^{0} F with the standard deviation 1.00. Difference is 0.94^{0}F. The difference between experimental and control group, post assessment temperature score is large and it is statistically significant.(student's independent t-test (**t= 3.96 P=0.001*****)).

Thus it is evident that in post assessment, there is statistically significant difference between experimental and control group temperature measurements.

The third objective is to compare the changes in body temperature after hot water foot bath therapy in both experimental and control group

On comparison, in experimental group the pre assessment mean temperature score was 101.45^{0}F and post assessment mean temperature score was 99.83^{0}F . After Hot water foot bath therapy, experimental group subjects were reduced by 1.59^{0}F. In control group, the pre assessment mean temperature score was 101.45^{0}F and post assessment mean temperature score was 100.80^{0}F, control group subjects are reduced using hospital routine care by 0.53^{0}F . Differences between pre assessment and post assessment score was analyzed using mean difference with 95% CI.

On an average, After hot water foot bath therapy, experimental group subjects are reduced 1.06^{0}F than control group subjects. This is net benefit of hot water foot bath therapy in reducing body temperature. Thus it shows that the hot water foot bath therapy is more effective in reducing body temperature among subjects with fever.

The findings are in consistent with the results of the study conducted by **Henker et.al**. The authors suggests that the efficiency of hot water foot bath therapy on reduction of body temperature may offer an insight in decision making process for appropriate intervention.

The fourth objective is to determine the association of changes in body temperature in both experimental and control group with selected base line variables.

Socio demographic variables and medical related information such as age, sex, religion, educational status, occupation, family income, marital status, body temperature, duration, previous hospitalization and associated symptoms are associated with post assessment level of body temperature among experimental group subject. Elder age (51-60 years), chi square test shows $x^2 = 8.58$, p=0.04, and female gender, chi square test shows $\chi 2=6.53$ P=0.01**. This shows that there is a relationship between body temperature and these variables. Elder peoples, females were having more reduced body temperature than others. Less days fever subjects, chi square test shows $\chi 2=8.46$ P=0.04 were reduced more temperature than others.

Therefore , statistically the results suggest that there was an association between demographic variables of subjects with fever and body temperature level after intervention with Hot water foot bath Therapy.

Chapter –VI

Summary And Conclusion

CHAPTER – VI
SUMMARY AND CONCLUSION

" In literature and in life we ultimately pursue, not conclusions, but beginning."

- Sam Tanenhaus

6.1 SUMMARY OF THE STUDY

The purpose of the study was to assess the effectiveness of hot water foot bath therapy in reducing body temperature among subjects with fever in medical wards in Rajiv Gandhi Government General Hospital, Chennai-03.

Fever, also known as pyrexia is one of the most common medical signs and is characterized by an elevation of body temperature above the normal range of 98.4 °F (37.2 °C) due to an increase in the temperature regulatory set-point. It increases in set-point triggers increased muscle tone and chills. Fever is the result of an immune response by your body to a foreign invader. These foreign invaders include virus, bacteria, fungi, drugs, or other toxins.

The present healthcare system under National Health Policy has been given a lot of emphasis on merging of alternative and complimentary therapies along with other treatments to provide comprehensive healthcare. Hydrothermal therapy is one such modality shown to be effective in reducing fever. Studies have shown that warm bathing helps to provide comfort and reduce high temperature. Heat causes the relaxation of the blood vessels, there by opening the vessels and increasing blood flow to the injured area.

Hot water foot bath therapy (HWFBT) one of the hydrotherapeutic measure, which improves warmth, promotes muscle relaxation, relieves pain, dilates blood vessel and promotes circulation, relaxes the connective tissue and

provides a soothing and healing effect. HWFBT is said to treat the underlying infection by activating the WBCs and immune system. Hot application to the skin increases the oxidation of the toxins and increases the blood flow through the peripheral vessels. It also increases the ability of the phagocytes to destroy the germs and detoxify the blood. Beneficial effect of increased blood flow to the tissue includes facilitation of drainage and "wash-out" effect, purging the tissue of debris and byproducts of tissue injury. Thus large quantities of bacterial poison can be eliminated.

A HWFBT increases nourishment to tissues, calms and relaxes tension. It is important for the nurse to consider the treatment modality, that is effective for the client, considering all the factors affecting thermoregulation. HWFBT is considered as a non pharmacological, safe and side effect free, cost effective, easy to administer. As pharmacological measures have reported side effects, it is always better to use non pharmacological measures to reduce fever. There are very few studies that are conducted to test and compare the effectiveness of different non pharmacological measures to reduce the fever.

Objectives of the study were

- To assess the body temperature of the patient before hot water foot bath therapy in both experimental and control group.

- To assess the body temperature of the patient after hot water foot bath therapy in experimental group.

- To compare the changes in body temperature after hot water foot bath therapy in both experimental and control group.

- To determine the association of changes in body temperature in both experimental and control group with selected demographic variables.

Hypothesis formulated were

H_1 There will be a significant difference in the temperature between experimental and control group after hot water foot bath therapy at 0.05 level of significance.

H_2 There will be a significant association of changes in temperature of subjects with selected demographic variables at 0.05 level of significance.

Assumptions of the study were

- ♠ Fever may be a result of several causes and it can be controlled by treating the underlying infection.

- ♠ Hot water application causes vasodilatation and there by enhances the immune system to reduce infection.

- ♠ Hot water application may have some effect on temperature.

Review of Literature was

Done to understand the extent of body temperature and to know the effectiveness of Hot Water Foot Bath Therapy in reducing body temperature of subjects with fever.

Methodology of the study was

A Quantitative approach, true experimental design was selected with 60 subjects, 30 for each Experimental and control group, by simple random sampling technique - lottery method from the sample frame within the inclusion

criteria. The study was carried out at medical wards, Rajiv Gandhi Government General Hospital, Chennai-03 with the permission of Head of the Department and Ethics Committee approval. Informed consent obtained from the subject and information about the study was given to them.

Subject selected for pilot study were excluded. Data was collected from the subjects with fever, clinical thermometer was used to assess the body temperature. Pre assessment was done in both groups using the clinical thermometer. intervention- Hot Water Foot Bath Therapy for fever subjects with associated symptoms was carried out for 15 min duration, upto 3 times a day for experimental group alone. For Control group, hospital routine care was given. Post assessment was carried out using the same clinical thermometer after interventions for both groups.

6.2 MAJOR FINDINGS

The findings of the study were

The findings show that overall body temperature is high in pre assessment for both experimental groups and control groups.

- Most of the subject are in the age group of 20 – 30 years (63.3%)(19) in experimental group and 50% (15) in control group respectively.

- Majority of the subject are male 50% (15) in experimental group and 66.7%(20) in control group.

- Majority of the subject belong to 73.3% (22)in experimental group and 76.7%(23) in control group.

- Majority of the subject are diploma 30% (9) & degree holder 30% (9) in experimental group and primary education 26.7% (8) in control group respectively.

- Majority of the subject are unemployed 46.7% (14) in experimental group. It denotes that majority of the subject in both groups are students of 20 – 30 years of age.

- 33.3% (10) of the subject'in experimental group and 40 % (12) in control group, the monthly income is less than Rs.1000/-. It reveals that lower socio economic status also have a role in fever and its management.

- Majority of the subject 46.7% (14) in each of experimental group and control group are unmarried.

- Most of the subject are taking non vegetarian diet 63.3% (19) in experimental group and 76.7% (23) control group respectively.

- Majority of the have body temperature 30 % (9) in experimental and control group. the duration of illness is about 43.3% (13) past 2 days and 43.3% (13) past 1 week and 40% (10) in control group respectively.

- Many subjects in both experimental group 76.6 % (23) and control group 83.3% (25) had no history of hospitalization. Majority of the subjects have associated symptoms 40% (12) in experimental group and 50% (15) in control group.

The findings of the study shows that the overall body temperature score was high in both the groups in pre assessment, in experimental group, In experimental group,30% (9) subjects are having 102^0F and 30% (9) had 101^0F 20% (6) had 103^0F and 20% (6) had 100^0F. In control group, 30% (9) had 102^0F,

26.7% (8) had 100^0F, 26.7% (8) had 101^0F and 16.7% (5) had 103^0F . the mean temperature score was 101.45F in experimental group and 101.33F in control group

Considering associated symptoms, in experimental group, 33.3%(10) are having vomiting, 10% (3) are having fatigue and 6.7% (2) are having eye congestion. In control group, 20% (6) are having vomiting, 13.3 % (4) are having fatigue and 6.7% (2) are having eye congestion. The mean associated symptom score was 40% in experimental group and 50% in control group.

Thus it is evident that in pre assessment, there is no statistically significant difference between experimental and control group temperature measurements. Therefore, statistically, the results suggest that there is an increased temperature and associated symptoms among subjects with fever. Therefore there is a need for systemic evaluation of temperature to initiate temperature reduction measures.

In the experimental group, on an average, the post assessment mean temperature score was 99.83 ^{O}F with the standard deviation 0.83 and in control group, the post assessment mean temperature was 100.80 ^{0} F with the standard deviation 1.00. Difference is 0.94^0F. The difference between experimental and control group post assessment temperature score is large and it is statistically significant.(student's independent t-test (**t= 3.96 P=0.001*****)). Thus it is evident that in post assessment, there is statistically significant difference between experimental and control group temperature measurements.

On comparison, in experimental group the pre assessment mean temperature score was 101.45^0F and post assessment mean temperature score was 99.83^0F . After Hot water foot bath therapy, experiment group subjects are reduced 1.59^0F and in control group, the pre assessment mean temperature score was 101.45^0F and post assessment mean temperature score was 100.80^0F,

control group subjects are reduced using routine treatment by 0.53^0F . Differences between pre assessment and post assessment score was analyzed using mean difference with 95% CI.

On an average, After hot water foot bath therapy, experimental group subjects are reduced 1.06^0F than control group subjects. This is net benefit of hot water foot bath therapy in reducing body temperature. It is clear from the above findings that intervention with Hot Water Foot Bath Therapy has reduced body temperature in subjects with fever.

In experimental group, Young age (20-30 years), chi square test shows x^2 = 8.58, p=0.04, and female gender $\chi 2$=6.53 P=0.01**. This shows that there is a relationship between body temperature and these variables. Young peoples, females, students are having more reduced body temperature than others.

Therefore , statistically the results suggest that there is association between demographic variables of subjects with fever and temperature level after intervention with Hot water foot bath Therapy.

6.3 NURSING IMPLICATIONS:

The study has implications , guidelines and suggestions for nursing practice, nursing education, nursing administration and nursing research.

NURSING PRACTICE:

- Nurses in wards have vital role in reducing fever & preventing its complications among subjects among subjects. So nurses can practice Hot Water Foot Bath Therapy for reducing temperature and preventing complications for fever subjects.

- ♣ Nurses should also teach fever subjects about Hot Water Foot Bath Therapy in reducing fever and encourage them to practice Hot Water Foot Bath Therapy to reduce degree of temperature.

- ♣ Nurse can practice Hot Water Foot Bath Therapy for relieving fatigue and insomnia.

NURSING EDUCATION:

- ♣ Nurse educator must strengthen the concept of prevention of complications of fever as an integral part of Nursing curriculum for under graduate and post graduate program.

- ♣ Nurse educator must encourage the student to learn about Hot Water Foot Bath Therapy to promote comfort and reduce the degree of temperature for fever subjects.

NURSING ADMINISTRATION:

- ♣ Nursing Administrator should conduct inservice education program for staff nurses about caring subjects with fever.

- ♣ Nursing administrator should supervise and guide nurses application of Hot Water foot Bath Therapy for fever.

- ♣ Nursing should monitor the standard of practice to promote excellence of caring subjects with fever.

NURSING RESEARCH:

- Nursing researcher should encourage the clinical nurse to apply the research findings in this daily nursing care activities.

- They motivate the clinical nurse to do further research studies on the effect of Hot Water Foot Bath Therapy on symptoms of fever.

- Nursing Researcher conduct periodic review of research findings and disseminate the findings through conference, national and international journals.

6.4 RECOMMENDATIONS

- The study can be conducted among large group of subjects.

- A study can be conducted to assess the effectiveness of Hot Water Foot Bath Therapy on subjects with fatigue.

- A study can be conducted to assess the effectiveness of Hot Water Foot Bath Therapy on subjects having headache.

- A study can be conducted to assess the effectiveness of Hot Water Foot Bath Therapy on subjects with insomnia.

- A comparative study can be conducted to assess the effectiveness of Hot Water Foot Bath Therapy and combination with other complementary therapies.

6.5 CONCLUSION:

Fever has been recognized as a symptom and not a disease. Fever is a natural response of the body that helps in fighting of foreign substances. Thermoregulatory center in the hypothalamus regulates body temperature. Once the temperature raises the person often feels warm, the cellular metabolism increases, oxygen consumption rises, heart rate and respiratory rate increases to meet the metabolic needs of the body. Hot Water Foot Bath Therapy is a simple therapeutic modality which can be carried out by the patient themselves in their homes and is economical . The present study shows that Hot Water Foot Bath Therapy is more effective in reducing body temperature for subjects with fever. Since this is a non pharmacological treatment, it is recommended at right time with prompt duration for fever subjects.

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Appendices

APPENDIX I

SECTION A

SOCIO DEMOGRAPHIC DATA

Tick against correct option:

Sample No:

1. Age in years

a) 20 -30 ☐ b) 31- 40 ☐

c) 41- 50 ☐ d) 51- 60 ☐

2. Sex

a) Male ☐ b) Female ☐

3. Religion

a) Hindu ☐ b) Christian ☐

c) Muslim ☐ d) others ☐

4. Educational Status

a) Illetrate ☐ b) Primary ☐ c) secondary ☐

d) Diploma ☐ e) Degree ☐

5. Occupation

a) Unemployed ☐ b) Government ☐ c) private ☐

d) Business ☐ e) Pensioner ☐

6. Income

a) Rs. < 1,000 ☐ b) Rs.1000 – 3,999 ☐ c) Rs. 4,000 -6,999 ☐

d) Rs. 7,000 – 9,999 ☐ e) Rs. > 10,000 ☐

7. Marital status

a) Unmarried ☐ b) married ☐ c) separated ☐

d) divorced ☐ e) widow/widower ☐

8. Dietary pattern

a) Vegetarian ☐ b) Non Vegetarian ☐

SECTION – B

MEDICAL RELATED INFORMATION:

1. Body Temperature

a) 100 ^{O}F ☐ b) 101 ^{0}F ☐

c) 102 ^{0}F ☐ d) 103 ^{0}F ☐

2. Duration of Fever

a) since last night ☐ b) past 1 day ☐

c) past 2 days ☐ d) past 1 week ☐

3. Previous history of hospitalization

a) yes ☐ b) No ☐

if yes, a) 1 time ☐ b) 2 times ☐ c)> 3 time ☐

4. Associated symptoms with fever

a) Vomiting ☐ b) Chills ☐ c) Rigor ☐

d) Fatigue ☐ e) Eye congestion/irritation ☐ f) Body pain ☐

செவிலியக் கல்லூரி

சென்னை மருத்துவ கல்லூரி

சென்னை -03

பகுதி - அ

சுயவிபர கேள்வி தாள்

மாதிரி எண்:

1. வயது

அ) 20 வயது முதல் 30 வயது வரை ☐

ஆ) 31 வயது முதல் 40 வயது வரை ☐

இ) 41 வயது முதல் 50 வயது வரை ☐

ஈ) 51 வயது முதல் 60 வயது வரை ☐

2. பாலினம்

அ) ஆண் ☐

ஆ) பெண் ☐

3. மதம்

அ) இந்து ☐

ஆ) கிரிஸ்தவர் ☐

இ) இஸ்லாமியர் ☐

ஈ) மற்றவர் ☐

4. கல்வித்தகுதி

அ) படிக்கதவர் ☐

ஆ) ஆரம்பகல்வி ☐

இ) மேல்நிலை ☐

ஈ) உயர் நிலை ☐

உ) பட்டபடிப்பு ☐

5. தொழில்

அ) வேலை இல்லாதவர் ☐

ஆ) தனியார் வேலை ☐

இ) அரசாங்க வேலை ☐

ஈ) சுய தொழில் ☐

6.மாதந்திர வருமானம்(ரூபாயில்)

அ) 1,000 கீழ் ☐

ஆ) 1,000 – 3,999 ☐

இ) 4,000 – 6,999 ☐

ஈ) 7,000 – 9,999 ☐

உ) 10,000 மேல் ☐

7. திருமண நிலை

அ) திருமணமாகாதவர் ☐

ஆ) திருமணமானவர் ☐

8. உணவு பழக்கவழக்கங்கள்

அ) சைவம் ☐

ஆ) அசைவம் ☐

பகுதி – ஆ

மருத்துவம் சார்ந்த தகவல்

அ) உடல் வெப்ப நிலை

அ) 100^0 ∴பேரென்கிட் ☐ 101^0 ∴பேரென்கிட் ☐

இ) 102^0 ∴பேரென்கிட் ☐ 03^0 ∴பேரென்கிட் ☐

ஆ) நோயுற்ற கால வரை

அ) நேற்று இரவில் இருந்து ☐

ஆ) கடந்த ஒரு நாளாக ☐

இ) இரண்டு நாட்களாக ☐

ஈ) ஒரு வாரதிற்கு மேலாக ☐

3. மருத்துவமனையில் அனுமதிக்கப்பட்ட முன் அனுபவம்

அ)ஆம் ☐ ஆ) இல்லை ☐

ஆம் என்றால்,

அ) ஒரு முறை ☐

ஆ) இரண்டு முறை ☐

இ) மூண்றுக்கு மேல் ☐

4. உடம்பில் காய்ச்சல் அல்லாத வேரு அறிகுறிகள்

அ)வாந்தி ☐குளிர்தல் இ)ர☐கம் ☐

ஈ)சோர்வு ☐கண் எரிச்சல் ஊ)உ☐பு வலி ☐

Lr. No. 277 / CON / MMC / Chennai-3 dt 15.07.13

From

Mrs. M.Muthupriya,
M.Sc(Nursing) II year,
College of Nursing,
Madras Medical College,
Chennai-3.

To

The Dean,
Madras Medical College,
Chennai-03.

Through Proper Channel,

Respected Sir,

Sub: Requesting Permission to conduct a research study-reg

I, Mrs.M.Muthu Priya, studying M.Sc.Nursing II year ,College of nursing, Madras Medical college, kindly request you to grant me permission for the study proposed to conduct on the topic **"A study to assess the effectiveness of hot water foot bath therapy in reducing body temperature among patients with fever in medical wards at Rajiv Gandhi Government General Hospital,Chennai-03. "** to fulfill the requirement of data collection. I assure you that it will not interfere with routine activities of the study settings.

Forwarded
15/07/13

Thanking you,

Date: 15/07/2013

Place: CHENNAI - 03.

Yours obediently,

(M.Muthupriya)

Lr.No. 277/CON(MMC/CH-3. dt. 15/7/13.

From

Mrs. M.Muthupriya,
M.Sc(Nursing) II year,
College of Nursing,
Madras Medical College,
Chennai-3.

To

The Professor and HOD,
Institute of Internal Medicine,
Rajiv Gandhi Government General Hospital
Chennai-03.

Through Proper Channel,

Respected Sir,

Permitted 23/7/13

Sub: Requesting Permission to conduct a research study-reg

I, Mrs.M.Muthu Priya, studying M.Sc.Nursing II year ,College of nursing, Madras Medical college, kindly request you to grant me permission for the study proposed to conduct on the topic **"A study to assess the effectiveness of hot water foot bath therapy in reducing body temperature among patients with fever in medical wards at Rajiv Gandhi Government General Hospital,Chennai-03. "** to fulfill the requirement of data collection. I assure you that it will not interfere with routine activities of the study settings.

Forwarded 15/07/13

Thanking you,

Date: 15/07/2013

Place: CHENNAI-03.

Yours obediently,

(M.Muthupriya)

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI -3

EC RegNo.ECR/270/Inst./TN/2013
Telephone No : 044 25305301
Fax : 044 25363970

CERTIFICATE OF APPROVAL

To
M.Muthu Priya,
M.Sc.,(N) II year,
College of Nursing,
Madras Medical College, Chennai-3.

Dear M.Muthu Priya

The Institutional Ethics committee of Madras Medical College, reviewed and discussed your application for approval of the proposal entitled "A Study to assess the effectiveness of hot water foot bath therapy in reducing body temperature among patients with fever in medical wards in Rajiv Ganthi Government General Hospital,Ch.03." No.01072013.

The following members of Ethics Committee were present in the meeting held on 06.07.2013 conducted at Madras Medical College, Chennai -3.

1. Dr.G.SivaKumar, MS FICS FAIS --- Chairperson
2. Prof. R. Nandhini MD -- Member Secretary
   Director, Instt. of Pharmacology ,MMC, Ch-3
3. Prof. Shyamraj MD -- Member
   Director i/c , Instt. of Biochemistry , MMC, Ch-3
4. Prof. P. Karkuzhali. MD -- Member
   Prof., Instt. of Pathology, MMC, Ch-3
5. Prof. Kalai Selvi -- Member
   Prof of Pharmacology, MMC, Ch-3
6. Prof. Siva Subramanian, -- Member
   Director, Instt. of Internal Medicine, MMC, Ch-3
7. Thiru. S. Govindsamy. BABL -- Lawyer
8. Tmt. Arnold Saulina MA MSW -- Social Scientist

We approve the proposal to be conducted in its presented form.

Sd/ Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, and SAE occurring in the course of the study, any changes in the protocol and patients information / informed consent and asks to be provided a copy of the final report.

R Nandini

Member Secretary, Ethics Committee

CERTIFICATE OF TOOL VALIDATION

This is to certify that the tool constructed by Mrs.M.Muthu priya, M.Sc Nursing II year, College of Nursing, Madras Medical College, Chennai -03. which is to be used in her study titled **"A study to assess the effectiveness of hotwater foot bath therapy in reducing body temperature among patients with fever in medical wards in Rajiv Gandhi Government General Hospital, Chennai-3"** has been validated by the undersigned. The suggestions and modifications given by me will be incorporated by the investigator in concern with their respective guide. Then she can proceed to do the research.

31/8/13

SIGNATURE WITH SEAL

DIRECTOR AND PROFESSOR
Institute of Internal Medicine
Madras Medical College,
Govt. General Hospital,
Madras-600 003

NAME :

DESIGNATION :

COLLEGE :

PLACE :

DATE :

CERTIFICATE OF TOOL VALIDATION

This is to certify that the tool constructed by Mrs.M.Muthu priya, M.Sc Nursing II year, College of Nursing, Madras Medical College, Chennai -03. which is to be used in her study titled **"A study to assess the effectiveness of hotwater foot bath therapy in reducing body temperature among patients with fever in medical wards in Rajiv Gandhi Government General Hospital, Chennai-3"** has been validated by the undersigned. The suggestions and modifications given by me will be incorporated by the investigator in concern with their respective guide. Then she can proceed to do the research.

SIGNATURE WITH SEAL

PRINCIPAL
MADHA COLLEGE OF NURSING
MADHANAGAR, KUNDRATHUR
CHENNAI - 600 069
PHONE: 24780736

NAME :

DESIGNATION :

COLLEGE :

PLACE :

DATE :

CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the dissertation topic "**A study to assess the effectiveness of Hot water foot bath therapy in reducing body temperature among patients with fever in medical wards in Rajiv Gandhi Government General Hospital, Chennai - 03**" done by **Mrs. M. Muthupriya,** M.Sc Nursing II year, College of Nursing, Madras Medical College, Chennai – 03, has been edited for English language appropriateness.

Date : 06. 02. 2014

Place: Chennai – 03.

(M. Gokul Praveen Babu, M.A)
Assistant Professor,
Department of English,
Tagore College of Arts and Science,
Chrompet,
Chennai – 44.

சுய ஒப்புதல் படிவம்

ஆய்வு செய்யப்படும் தலைப்பு

"காய்ச்சல் நோயாளிகளுக்கு, சுடுதண்ணீரில் பாதத்தை மூழ்க வைப்பதன்மூலம் உடல் வெப்பத்தை குறைப்பது பற்றிய ஓர் திறன் ஆய்வு"

பங்கு பெறுபவரின் பெயர்: வயது: தேதி: உள் நோயாளி எண்:

..... என்பவராகிய நான் இந்த ஆய்வின் விவரங்களும் அதன் நோக்கங்களும் முறையாக அறிந்து கொண்டேன். எனது சந்தேகங்கள் அனைத்திற்கும் தகுந்த விளக்கம் அளிக்கப்பட்டது. இந்த ஆய்வில் முழு சுதந்திரத்துடன் மற்றும் சுயநினைவுடன் பங்கு கொள்ள சம்மதிக்கிறேன்.

எனக்கு விளக்கப்பட்ட விஷயங்களை நான் புரிந்துகொண்டு நான் எனது சம்மதத்தைத் தெரிவிக்கிறேன். இச்சுய ஒப்புதல் படிவத்தை பற்றி எனக்கு விளக்கப்பட்டது.

இந்த ஆய்வினை பற்றிய அனைத்து தகவல்களும் எனக்கு தெரிவிக்கப்பட்டது. இந்த ஆய்வில் எனது உரிமை மற்றும் பங்கினை பற்றி அறிந்து கொண்டேன்.

இந்த ஆய்வில் பிறரின் நிர்பந்தமின்றி என் சொந்த விருப்பத்தின்பேரில் தான் பங்கு பெறுகிறேன் மற்றும் நான் இந்த ஆராய்ச்சியிலிருந்து எந்நேரமும் பின்வாங்கலாம் என்பதையும் அதனால் எந்த பாதிப்பும் ஏற்படாது என்பதையும் நான் புரிந்து கொண்டேன்.

இந்த ஆய்வில் கலந்து கொள்வதன்மூலம் என்னிடம் பெறப்படும் தகவலை ஆய்வாளர் இன்ஸ்டிட்யூசனல் எத்திக்ஸ் கமிட்டியினரிடமோ, அரசு நிறுவனத்திடமோ தேவைப்பட்டால் பகிர்ந்து கொள்ளலாம் என சம்மதிக்கிறேன்.

இந்த ஆய்வின் முடிவுகளை வெளியிடும்போது எனது பெயரோ, அடையாளமோ வெளியப்படாது என அறிந்து கொண்டேன். இந்த ஆய்வின் விவரங்களைக் கொண்ட தகவல்தாளைப் பெற்றுக் கொண்டேன்.

இந்த ஆய்வில் பங்கேற்கும்பொழுது ஏதேனும் சந்தேகம் ஏற்பட்டால், உடனே ஆய்வாளரை தொடர்பு கொள்ள வேண்டும் என அறிந்து கொண்டேன்.

இச்சுய ஒப்புதல் படிவத்தில் கையெழுத்திடுவதன்மூலம் இதிலுள்ள அனைத்து விஷயங்களும் எனக்கு தெளிவாக விளக்கப்பட்டது என்று தெரிவிக்கிறேன். இச்சுய ஒப்புதல் படிவத்தின் ஒரு நகல் எனக்கு கொடுக்கப்படும் என்று தெரிந்து கொண்டேன்.

ஆராய்ச்சியாளர் கையொப்பம்
தேதி:

பங்கேற்பாளர் கையொப்பம்
தேதி:

PROCEDURE OF HOT WATER FOOT BATH THERAPY

INTRODUCTION:

When the feet are in hot water, the blood which is congesting distant parts of the body is brought to the dilated vessels in the feet and legs. Congestion of the brain, lungs, abdominal and pelvic organs can be relieved in this manner.

DEFINITION:

A hot foot bath is a local immersion bath covering the feet and ankles at temperatures ranging from 100^0F to 115^0F (43^0C- 46^0C). Hot foot baths increase blood flow through the feet and entire skin surface, relieving congestion in internal organs and brain. This type of bath also reduces the body temperature, relaxing tense muscles and increasing white blood cell activity.

INDICATIONS

Foot bath treatment can help with the following health problems:

- Cold feet
- **Fever (100^0F and 103°F)**
- Headache
- Pelvic cramps
- Hemorrhoids and prostate problems
- Pain anywhere in the body from toothache to backache
- Insomnia, fatigue
- depression, according to Dr. Neil Nedley:

CONTRA INDICATIONS

However, hot foot bath treatment is dangerous if you have the following health conditions:

- Peripheral vascular disorder.

- Loss of sensation in the legs.
- Unconsciousness.
- Those who can’t assume sitting position.
- Peripheral neuropathy.
- Ulcer, lesion, or allergy in the leg.
- Chronic organ damage.

TEMPERATURE:

HOT WATER TEMPERATURE: 100° and 115°F

SOAKING TIME:

15-20 MINUTES

HOW OFTEN:

Until the temperature comes down by 1-2°F.

EQUIPMENT

- foot tub or container
- Lotion Thermometer to test that the water is between 100° and 115° F (43°C- 46°C)
- Sheet and blanket
- Heavy towel and washcloth for cold compress
- Material for protection of the bed, if needed
- Clinical thermometer

PROCEDURE:

1. Explain procedure to the patient.
2. Have room warm and free of drafts.
3. Assemble the materials.
4. Protect the bedding, if needed.

5. Drape the two blankets over a chair or spread on a bed.
6. Fill bucket with water 100° F to 115° F (43°C- 46°C) high enough to cover ankles.
7. Assist patient in undressing and wrap in sheet.
8. Wrap towel around patient's neck to catch sweat and prevent escape of body heat.
9. Assist patient to place feet in tub. Reassure patient by putting your hands in the water first.
10. Wrap the blankets one at a time around the patient, enclosing the tub to allow heat to build up.
11. Add hot water as patient can tolerate it, up to 120° F (49°C)
12. Continue treatment for 15-20 minutes as needed.
13. Put thick, warm socks on the patient, allowing them to rest in bed for at least 30 minutes, drinking lots of water.